

GENERAL BIBLIOGRAPHY

The bibliography is in two sections. First comes the list of books, to most of which reference has been made in the text. The reference numbers of books are prefixed by the letter B.

The second part contains articles from periodicals. It would be several times longer if it contained all references that bear on the subject, including publications in the various technical, popular, and radio periodicals, reports of scientific and engineering congresses, and annual reports of national laboratories.

At the ends of some of the chapters are classified lists of references. These lists consist in part of items in the General Bibliography and in part of books or articles on those special topics with which the particular chapters are concerned.

A fairly complete bibliography on piezoelectricity was published by the author in 1928.⁹⁹ Many of the references in that bibliography are here omitted. Those of chief historical interest have been retained, together with certain ones to which reference is made in the text.

The 1928 bibliography contained also a list of patents bearing on the subject. Since then a vast number of patents have been issued in various countries, ranging all the way from inventions of fundamental importance to trifling details. A few of them are mentioned in the text.

A special bibliography for Appendix II begins on page 764.

ABBREVIATIONS OF NAMES OF PERIODICALS

<i>Abh. Gött.</i>	Abhandlungen der Gesellschaft der Wissenschaften zu Göttingen
<i>Abh. Sächs.</i>	Abhandlungen der mathematischen-physikalischen Klasse der Sächsischen Akademie der Wissenschaften zu Leipzig
<i>Alta freq.</i>	Alta frequenza
<i>An. chim. phys.</i>	Annales de chimie et de physique
<i>An. fr. chron.</i>	Annales françaises de chronométrie
<i>An. Phk.</i>	Annalen der Physik (from 1824 to 1899, Annalen der Physik und Chemie)
<i>An. Phq.</i>	Annales de physique
<i>Ann. soc. sci. Brux.</i>	Annales de la société scientifique de Bruxelles
<i>Anz. Wien</i>	Anzeiger der Akademie der Wissenschaften zu Wien, mathematisch-naturwissenschaftliche Klasse
<i>A.P.T.</i>	American Physics Teacher
<i>Arch. sci. phys. nat.</i>	Archives des sciences physiques et naturelles. Geneva
<i>A.W.A. Tech. Rev.</i>	A.W.A. Technical Review. Published by Amalgamated Wireless (Australasia), Ltd., Sydney, Australia
<i>Bell Labs. Rec.</i>	Bell Laboratories Record
<i>Bell Syst. T.J.</i>	Bell System Technical Journal
<i>Ber. Sächs.</i>	Berichte der Königlichen Sächsischen Gesellschaft der Wissenschaften (mathematisch-physikalische Klasse)

*Ber. Wien*Sitzungsberichte der Akademie der Wissenschaften
zu Wien (mathematisch-naturwissenschaftliche
Klasse)*Brit. Rad. Ann.*

British Radio Annuals

*Bull. soc. min. fr.*Société française de minéralogie, bulletin. Until
1885, société minéralogique de France*Can. J. Res.*

Canadian Journal of Research

*C.R.*Comptes rendus hebdomadaires des séances de
l'académie des sciences*C.R. congrès int. d'élec.*Comptes rendus du congrès international d'électricité,
Paris, 1932*C.R. (Russ.)*Comptes rendus (Doklady), Akademia Nauk,
S.S.R., Leningrad; published in both a Russian
edition and a French-English-German edition with
French title*Dati e mem.*

Dati e memorie sulle radiocomunicazioni, Rome

Denki Hyoron

Denki Hyoron (Kyoto) (in Japanese)

Elec. Comm.

Electrical Communication

*Elec. Rev. (Jap.)*Electrical Review (Japan) (Electrotechnical Labora-
tory Tokyo)*Electrotech. Jour. (Jap.)*Journal of the Electrotechnical Laboratory, Ministry
of Communications, Tokyo, Japan*ENT*

Elektrische Nachrichten-Technik, Berlin

ENW

Elektrisches Nachrichtenwesen, Berlin

*Ergeb. exakt. Naturwiss.*Ergebnisse der exakten Naturwissenschaften, Her-
ausgegeben von der Schriftleitung der "Natur-
wissenschaften," Verlag von Julius Springer,
Berlin*ETZ*

Elektrotechnische Zeitschrift

F. M. Mag.

Frequency Modulation Magazine

Funktech. Mon.

Funktechnische Monatshefte

G.E. Rev.

General Electric Review

Helv. Ph. Ac.

Helvetica Physica Acta

*Hfrc. u. El. ak.*Hochfrequenztechnik und Elektroakustik, Jahrbuch
der Drahtlosen Telegraphie und Telephonie
(formerly Zeitschrift für Hochfrequenztechnik)*Izv. El. Slab. Toka*Izvestia Elektromyshlennosti Slabogo Toka, Lenin-
grad and Moscow*J.A.S.A.*

Journal of the Acoustical Society of America

J. Am. Chem. Soc.

Journal of the American Chemical Society

J. Appl. Ph.

Journal of Applied Physics

*J. Appl. Ph. (Russian)*Journal of Applied Physics, Leningrad and Moscow
(in Russian)*J. Exp. Th. Ph. U.S.S.R.*Journal of Experimental and Theoretical Physics,
Leningrad*J. Frank. Inst.*

Journal of the Franklin Institute

*J.I.E.E. (Japan)*Journal of the Institute of Electrical Engineers of
Japan*J.I.E.E. (London)*Journal of the Institution of Electrical Engineers
(England)*J.I.T.T.E. Jap.*Journal of Institute of Telegraph and Telephone
Engineers of Japan (in Japanese)

<i>J.O.S.A.</i>	Journal of the Optical Society of America
<i>J. Ph. U.S.S.R.</i>	Journal of Physics of the U.S.S.R.
<i>J. phq.</i>	Journal de physique et le radium. Until 1919, Journal de physique théorique et appliquée
<i>J. Res. N.B.S.</i>	Journal of Research of the National Bureau of Standards (from 1928 to 1934, Bureau of Standards Journal of Research)
<i>J. Russ. Ph.-Chem. Soc.</i>	Journal of the Russian Physical Chemical Society, Leningrad (in Russian)
<i>J. Sci. Instr.</i>	Journal of Scientific Instruments, London
<i>J. Tech. Phys.</i>	Journal of Technical Physics (in Russian)
<i>Konink. Akad. Amst.</i>	Koninklijke Akademie van Wetenschappen te Amsterdam, Proceedings
<i>L'Elettrot.</i>	L'Elettrotecnica, Milan
<i>L'Onde élec.</i>	L'Onde électrique
<i>Luftfahrt-F.</i>	Luftfahrtforschung
<i>Nachr. Gött.</i>	Gesellschaft der Wissenschaften zu Göttingen, Nachrichten, mathematisch-physikalische Klasse
<i>Naturwiss.</i>	Die Naturwissenschaften, Berlin
<i>Neues Jahrb. Min.</i>	Neues Jahrbuch für Mineralogie, Geologie und Paläontologie
<i>Nippon Elec. Comm. Eng.</i>	Nippon Electrical Communication Engineering, Institute of Electrical Communication Engineers of Japan, Tokyo
<i>Phil. Mag.</i>	Philosophical Magazine
<i>Phys. Rev.</i>	Physical Review
<i>Phys. ZS</i>	Physikalische Zeitschrift
<i>Phys. ZS. d. Sowjetunion</i>	Physikalische Zeitschrift der Sowjetunion
<i>P.O.E.E.J.</i>	Post Office Electrical Engineers' Journal, London
<i>Proc. A.A.A.S.</i>	Proceedings of the American Academy of Arts and Sciences
<i>Proc. A.I.E.E.</i>	Proceedings of the American Institute of Electrical Engineers
<i>Proc. I.R.E.</i>	Proceedings of the Institute of Radio Engineers
<i>Proc. Nat. Acad. Sci.</i>	Proceedings of the National Academy of Sciences of the United States of America
<i>Proc. Ph. Soc.</i>	Proceedings of the Physical Society, London
<i>Proc. Roy. Soc.</i>	Proceedings of the Royal Society of London, A, papers of mathematical or physical character
<i>Proc. World Eng. Cong., Tokyo</i>	Proceedings of the World Engineering Congress, Tokyo
<i>QST</i>	QST, published by the American Radio Relay League
<i>QST fr.</i>	QST français
<i>Radio-Centrum</i>	Radio-Centrum, journal of the Nederlandsche vereeniging voor radiotelegraphie, The Hague
<i>Rass. P.T.T.</i>	Rassegna delle Poste, dei Telegrafi e dei Telefoni, Rome
<i>Rep. El. Res. Inst. Tokyo</i>	Reports of the Electrical Research Institute of the Tokyo Municipality
<i>Rev. d'opt.</i>	Revue d'optique, théorique et instrumentale, Paris
<i>Rev. gén. de l'élec.</i>	Revue générale de l'électricité
<i>R.R.R.W. Jap.</i>	Reports of Radio Researches and Works in Japan

<i>R.S.I.</i>	Review of Scientific Instruments
<i>Sci.</i>	Science
<i>Sci. Pap. Bur. St.</i>	Scientific Papers of the Bureau of Standards, Washington
<i>Tech. Phys. U.S.S.R.</i>	Technical Physics of the U.S.S.R., Leningrad
<i>Telef. Hausmitt.</i>	Telefunken Hausmitteilungen
<i>Telef.-Z.</i>	Telefunken-Zeitung
<i>T.R. Bull.</i>	T. and R. Bulletin, Official Journal of the Radio Society of Great Britain
<i>Trans. A.I.E.E.</i>	Transactions of the American Institute of Electrical Engineers
<i>Trans. Conn. Acad.</i>	Transactions of the Connecticut Academy of Arts and Sciences
<i>Trans. Roy. Soc. Can.</i>	Transactions of the Royal Society of Canada
<i>U.R.S.I. Gen. Assem.</i>	Proceedings of the General Assembly, International Scientific Radio Union
<i>V.D.I.</i>	Zeitschrift des Vereines Deutscher Ingenieure, Berlin
<i>Wied. An.</i>	Wiedemann's Annalen
<i>W.E.</i>	The Wireless Engineer and Experimental Wireless. Originally, Experimental Wireless, then Experi- mental Wireless and the Wireless Engineer, London
<i>W. World</i>	Wireless World and Radio Review, London
<i>Zentr. f. Min.</i>	Zentralblatt für Mineralogie, Geologie und Paläontologie, Abt. A
<i>ZS. Elektrochem.</i>	Zeitschrift für Elektrochemie
<i>ZS. Hfr.</i>	Zeitschrift für Hochfrequenztechnik (see Hochfre- quenztechnik und Elektroakustik)
<i>ZS. Instr.</i>	Zeitschrift für Instrumentenkunde, Berlin
<i>ZS. Kr.</i>	Zeitschrift für Kristallographie
<i>ZS. Ph.</i>	Zeitschrift für Physik
<i>ZS. ph. Chem.</i>	Zeitschrift für physikalische Chemie
<i>ZS. tech. Ph.</i>	Zeitschrift für technische Physik

BOOKS

- B1. AUERBACH, F., and W. HORT: "Handbuch der physikalischen und technischen Mechanik," vol. 3, J. A. Barth, Leipzig, 1927, 468 pp.
- B2. BARTON, EDWIN H.: "A Text-Book on Sound," Macmillan & Co., Ltd., London, 1919, 687 pp.
- B3. BEDEAU, F.: "Le Quartz piézo-électrique et ses applications dans la technique des ondes hertziennes" (Memorial des sciences physiques, Fasc. VI), Gauthier-Villars & Cie, Paris, 1928, 64 pp.
- B4. BERGMANN, L.: "Schwingende Kristalle und ihre Anwendung in der Hochfrequenz-und Ultraschalltechnik," B. G. Teubner, Leipzig, 1937, 47 pp.
- B5. BERGMANN, DR. LUDWIG: "Der Ultraschall und seine Anwendung in Wissenschaft und Technik," Berlin, VDI-Verlag G.m.b.H., 1937, 230 pp.; 6th ed., S. Hirzel, Stuttgart, 1954, 1114 pp.; English translation of the 1st edition entitled "Ultrasonics and Their Scientific and Technical Applications," by Dr. H. Stafford Hatfield, George Bell & Sons, Ltd., London, John Wiley & Sons, Inc., New York, 1939, 264 pp.

- B6. BORN, MAX: "Atomtheorie des festen Zustandes," 2d ed., B. G. Teubner, Leipzig and Berlin, 1923, 262 pp.
- B7. BORN, MAX: "Optik, ein Lehrbuch der elektromagnetischen Lichttheorie," Verlag Julius Springer, Berlin, 1933, 591 pp. (Chapter on Crystal Optics.)
- B8. BRAGG, W. L.: "Atomic Structure of Minerals," Cornell University Press, Ithaca, New York, 1937, 292 pp.
- B9. CRANDALL, IRVING B.: "Theory of Vibrating Systems and Sound," D. Van Nostrand Company, Inc., New York, 1926, 272 pp.
- B10. CURIE, P.: "Œuvres de Pierre Curie," Gauthier-Villars & Cie, Paris, 1908, 621 pp.

Contains reprints of following papers on piezoelectricity (pages in the "Œuvres" are printed in boldface type): (a) *C.R.*, vol. 91, p. 294, 1880 (6); (b) *C.R.*, vol. 91, p. 383, 1880 (10); (c) *C.R.*, vol. 92, p. 186, 1881 (15); (d) *C.R.*, vol. 92, p. 350, 1881; *Jour. d. phys.*, 2d ser., vol. 1, p. 245, 1882 (18); (e) *C.R.*, vol. 93, p. 204, 1881; *Jour. d. phys.*, 2d ser., vol. 1, p. 245, 1882 (22); (f) *C.R.*, vol. 93, p. 1137, 1881 (26); (g) *C.R.*, vol. 95, p. 914, 1882 (30); (h) *Bulletin des séances de la société française de physique*, 1887 p. 47, (33); (i) *C.R.*, vol. 106, p. 1287, 1888; *Jour. d. phys.*, 2d ser., vol. 8, p. 149, 1889 (35); (j) *An. chim. Phys.*, 6th ser., vol. 17, p. 392, 1889 (554); (k) *Jour. d. phys.*, 3d ser., vol. 3, p. 393, 1894 (118). References (h) and (k) are by P. Curie; (j) by J. Curie; the remainder by P. and J. Curie.

- B11. CURIE, MME. P.: "Traité de Radioactivité," vol. 1, Gauthier-Villars & Cie, Paris, 1910; "Die Radioaktivität," (German translation by B. Finkelstein), vol. 1, Akademische Verlagsgesellschaft m.b.H., Leipzig, 1912, 420 pp.
- B12. DAKE, H. C., F. L. FLEENER, and B. H. WILSON: "Quartz Family Minerals," Whittlesey House, New York, 1938, 304 pp.
- B13. DALE, A. B.: "The Form and Properties of Crystals," University Press, Cambridge, London, 1932, 186 pp.
- B14. DAVEY, WHEELER P.: "A Study of Crystal Structure and Its Applications," McGraw-Hill Book Company, Inc., New York, 1934, 695 pp.
- B15. DEBYE, P.: "Polar Molecules," Dover Publications, Inc., New York, 1954, 172 pp.
- B16. DEBYE, P., and H. SACK: "Theorie der elektrischen Molekulareigenschaften," Handbuch der Radiologie, 2d ed., vol. 6, part 2, pp. 69-204, 1934; also issued as a separate publication by the Akademische Verlagsgesellschaft m.b.H., Leipzig, 1934.
- B17. "Encyclopädie der mathematischen Wissenschaften," edited by A. Sommerfeld, vol. 5, B. G. Teubner, Leipzig, 1903-1926.
- B18. FOWLER, R. H.: "Statistical Mechanics," 2d ed., Cambridge University Press, London, 1936, 864 pp.
- B19. GEIGER, H., and K. SCHEEL: "Handbuch der Physik," Verlag Julius Springer, Berlin. Vol. 6, 1927: F. Pfeiffer, Theory of Vibrations (including crystals), pp. 334-403; J. W. Geckeler, Elasticity of Crystals (with references and numerical data), pp. 404-427. Vol. 8, 1927: H. Lichte, Piezoelectric Transmitters for Sound Waves, pp. 332-335. Vol. 12, 1927: A. Güntherschulze, Electrostriction, pp. 555-559. Vol. 13, 1928: H. Falkenhagen, Pyro- and Piezoelectricity (with some applications); pp. 291-331.
- B20. GRAETZ, L.: "Handbuch der Elektricität und des Magnetismus," vol. 1, J. A. Barth, Leipzig, 1918: R. v. Hirsch, Electrostriction, pp. 262-270; E. Riecke, Pyro- and Piezoelectricity, pp. 342-419.
- B21. GRAMONT, A. DE: "Recherches sur le quartz piézoélectrique," Éditions de la Revue d'optique théorique et instrumentale, Paris, 1935, 113 pp.

- B22. GROTH, P.: "Physikalische Krystallographie," Wilhelm Engelmann, Leipzig, 1905, 820 pp.; also "Elemente der physikalischen u. chemischen Krystallographie," R. Oldenbourg, Munich and Berlin, 1921, 363 pp.
- B23. HANDEL, P. von: "Grundlagen der Kurzwellen-Sendung," in "Hochfrequenztechnik in der Luftfahrt," edited by H. Fassbender, Verlag Julius Springer, Berlin, 1932, pp. 228-248.
- B24. HIEDEMANN, EGON: "Grundlagen und Ergebnisse der Ultraschallforschung," Walter de Gruyter & Company, Berlin, 1939, 287 pp.
- B25. HINTZE, C.: "Handbuch der Mineralogie," Veit, Leipzig, 1897-1933.
- B26. HONESS, A. P.: "The Nature, Origin and Interpretation of the Etch Figures on Crystals," John Wiley & Sons, Inc., New York, 1927, 171 pp.
- B27. HUND, AUGUST: "Hochfrequenzmesstechnik," 2d ed., Verlag Julius Springer, Berlin, 1928, 526 pp.
- B28. HUND, AUGUST: "High-frequency Measurements," McGraw-Hill Book Company, Inc., New York, 1933, 491 pp.
- B29. "International Critical Tables," vol. 6, pp. 207-212, Electroelastic and Pyroelectric Phenomena, McGraw-Hill Book Company, Inc., New York, 1929.
- B30. JOFFÉ, A. F.: "The Physics of Crystals," 1st ed., McGraw-Hill Book Company, Inc., New York, 1928, 198 pp.
- B31. KOGA, I.: "Elements of Piezoelectric Oscillating Crystal Plate," Institute of Electrical Engineers of Japan, 1933, 76 pp., (in Japanese).
- B32. KURCHATOV, I. V.: "Seignette Electricity," Moscow, 1933, 104 pp. (in Russian); French translation, abbreviated, entitled "Le Champ moléculaire dans les diélectriques (le sel de Seignette)," by I. V. Kourtschatov, Hermann & Cie, Paris, 1936, 47 pp..
- B33. LAMB, HORACE: "The Dynamical Theory of Sound," Dover Publications, Inc., New York, 1960, 308 pp.
- B34. LOVE, A. E. H.: "A Treatise on the Mathematical Theory of Elasticity," 4th ed., Dover Publications, Inc., New York, 1944, 643 pp.
- B35. MASON, WARREN P.: "Electromechanical Transducers and Wave Filters," D. Van Nostrand Company, Inc., New York, 1942, 333 pp.
- B36. MARX, DR. ERICH: "Handbuch der Radiologie," Leipzig, 2d ed., vol. 6, published by Dr. Erich Marx, Akademische Verlagsgesellschaft m.b.H., Die Theorien der Radiologie, 1934.
- B37. MOULLIN, E. B.: "The Theory and Practice of Radio Frequency Measurements," 2d ed., Charles Griffin & Company, Ltd., London, 1931, 487 pp.
- B38. MYERS, L. M.: "Television Optics: An Introduction," Pitman Publishing Corporation, New York, 1936, 338 pp.
- B39. PETRZILKA, V., and J. B. SLAVIK: "Piezoelektrina—A Jeji Pouziti V Technicke Praxi," Jednoty ceskych matematiku a fysiku, Prague, 1940, 117 pp.
- B40. POCKELS, F.: "Über den Einfluss des elektrostatischen Feldes auf das optische Verhalten piezoelektrischer Krystalle," Dieterisch'sche Verlagsbuchhandlung, Göttingen, 1894, 204 pp.
- B41. POCKELS, F.: "Lehrbuch der Kristalloptik," B. G. Teubner, Leipzig and Berlin, 1906, 519 pp.
- B42. POYNTING, J. H., and J. J. THOMSON: "A Text-book of Physics," vol. 4, Electricity and Magnetism, part 1, London, 1920; Pyroelectricity and Piezoelectricity, pp. 148-163.
- B43. RAYLEIGH, LORD: "The Theory of Sound," Dover Publications, Inc., New York, 1945, vol. 1, 480 pp.; vol. 2, 504 pp.
- B44. ROGERS, AUSTIN F., and PAUL F. KERR: "Optical Mineralogy," McGraw-Hill Book Company, Inc., New York, 1942, 390 pp.

- B45. SCHEIBE, DR. A.: "Piezoelektrizität des Quarzes," Theodor Steinkopf, Dresden and Leipzig, 1938, 233 pp.
- B46. SHUBNIKOV, A. V.: "Quartz and Its Applications," Press of the Academy of Science of the U.S.S.R., Moscow and Leningrad, 1940, 194 pp. (in Russian).
- B47. SOSMAN, R. B.: "The Properties of Silica," Chemical Catalog Company, Inc., New York, 1927, 856 pp.
- B48. TUTTON, A. E. H.: "Crystallography and Practical Crystal Measurement," 2d ed., Macmillan & Company, Ltd., London, 1922, 2 vols., 746 and 699 pp.
- B49. VAN VLECK, J. H.: "The Theory of Electric and Magnetic Susceptibilities," Oxford, Clarendon Press, New York, 1932, 384 pp.
- B50. VIGOUREUX, P.: "Quartz Resonators and Oscillators," His Majesty's Stationery Office, London, 1931, 217 pp.
- B51. VIGOUREUX, P.: "Quartz Oscillators and Their Applications," His Majesty's Stationery Office, London, 1939, 131 pp.
- B52. VOIGT, W.: "Lehrbuch der Kristallphysik," B. G. Teubner, Leipzig, 1st ed., 1910, 964 pp.; 2d ed., 1928, 978 pp., identical with the first except for the addition of an appendix on secondary effects in the flexure and torsion of circular cylinders, based on refs. 573 and 576.
- B53. WIEN, W., and F. HARMS: "Handbuch der Experimentalphysik," Akademische Verlagsgesellschaft m.b.H., Leipzig. Vol. 10, 1930: G. Hoffmann, Electrostriction, pp. 262-267; Pyro- and Piezoelectricity (with brief statement of applications), pp. 327-345. Vol. 13, part 2, 1928: H. Rothe, Quartz Resonators, pp. 437-453. Vol. 17, part 1, 1934: H. Schmidt, Vibrations of Solids (including crystals), pp. 285-454; E. Grossmann, Ultrasonics, pp. 469-534.
- B54. WINKELMANN, A.: "Handbuch der Physik," Leipzig, vol. 4, part 1, 1905: L. Graetz, Electrostriction, pp. 162-168; F. Pockels, Pyro- and Piezoelectricity, pp. 766-791.
- B55. WOOD, R. W.: "Supersonics, the Science of Inaudible Sounds," Charles K. Colver Lectures, 1937, Brown University, Providence, R.I., 1939, 158 pp.
- B56. WOOSTER, W. A.: "A Text-book on Crystal Physics," Cambridge University Press, London, 1938, 295 pp.
- B57. WYCKOFF, R. W. G.: "The Analytical Expression of the Results of the Theory of Space-groups," Carnegie Institute of Washington, 1922, 180 pp.; 2d edition, 1930, 180 pp.

PERIODICALS

- ACKERMANN, W.: Dependence of Pyroelectricity on Temperature, *An. Phk.*, vol. 46, pp. 197-220, 1915.
- AMARI, S.: On the Frequency Variation of Quartz-controlled Short-wave Radio Transmitters, *R.R.R.W. Jap.*, vol. 6, absts, p. 9, 1936.
- ANDERSON, J. E.: Frequency Characteristics of Piezoelectric Oscillators, *Electronics*, vol. 11, pp. 22-24, August, 1938.
- ANDREEFF, A., V. FRÉEDERICKSZ, and I. KAZARNOWSKY: The Dependence of the Piezoelectric Constants of Quartz upon Temperature, *ZS. Ph.*, vol. 54, pp. 477-483, 1929.
- ANGRISANO, G.: Experimental Arrangement for the Determination of the Resonance Curves of Piezoelectric Resonators, *L'Elettrot.*, vol. 17, pp. 678-679, 1930.
- ANTSELOVICH, E. S.: On the Stability of Oscillators, *Izv. El. Slab. Toka*, no. 6, pp. 28-39, 1935.
- ANTSELOVICH, E. S.: The Frequency Stability of Crystal-controlled Valve Oscillators, *Izv. El. Slab. Toka*, no. 9, pp. 1-9, 1935.

8. ARKHANGEL'SKAYA, A.: Measurement of the Parameters of Quartz Plates, *Izv. El. Slab. Toka*, nos. 8/9, pp. 28-35, 1938.
9. ARNULF, A.: Examination of Raw Quartz Crystals by Immersion, *Rev. d'opt.*, vol. 10, pp. 453-473, 1931.
10. ARX, A. VON, and W. BANTLE: Polarization and Specific Heat of KH_2PO_4 , *Helv. Ph. Ac.*, vol. 16, pp. 211-214, 1943.
11. ARX, A. VON, and W. BANTLE: The Converse Piezoelectric Effect in KH_2PO_4 , *Helv. Ph. Ac.*, vol. 16, pp. 416-418, 1943.
12. ATANASOFF, J. V., and P. J. HART: Dynamical Determination of the Elastic Constants and Their Temperature Coefficients for Quartz, *Phys. Rev.*, vol. 59, pp. 85-96, 1941.
13. ATANASOFF, J. V., and E. KAMMER: A Determination of the c_{44} Elastic Constant for Beta-quartz, *Phys. Rev.*, vol. 59, pp. 97-99, 1941.
14. AWENDER, H., and E. BUSSMAN: A Heterodyne Adaptor Unit for 1.6 m Wavelength with and without Crystal Control, *Funktech. Mon.*, no. 12, pp. 441-442, 1936.
15. BAHRS, S. and J. ENGL: On the Piezoelectric Effect with Ammonium Chloride Crystals Having a Transition Point at -30.5° , *ZS. Ph.*, vol. 105, pp. 470-477, 1937.
16. BALDWIN, C. F.: Quartz Crystals, *G.E. Rev.*, vol. 43, pp. 188-194, 237-243, 1940.
17. BALDWIN, C. F.: Quartz Crystals in Radio, *Communications*, vol. 22, pp. 20f., October, 1942.
18. BALDWIN, F. C., and S. A. BOKOVY: Practical Operating Advantages of Low-Temperature-Frequency Coefficient Crystals, *QST*, vol. 19, pp. 26, 27, 92, January, 1935.
19. BALZER, K.: A Contribution to the Problem of Multiple Waves in Piezoelectric Quartz Plates, *ZS. tech. Ph.*, vol. 18, pp. 169-170, 1937.
20. BANCROFT, D.: The Effect of Hydrostatic Pressure on the Susceptibility of Rochelle Salt, *Phys. Rev.*, vol. 53, pp. 587-590, 1938.
21. BANCROFT, D.: The Velocity of Longitudinal Waves in Cylindrical Bars, *Phys. Rev.*, vol. 59, pp. 588-593, 1941.
22. BANTLE, W.: The Specific Heat of Seignette-electric Substances. Dielectric Measurements on KD_2PO_4 Crystals, *Helv. Ph. Ac.*, vol. 15, pp. 373-404, 1942.
23. BANTLE, W.: Artificial Crystals of KH_2PO_4 as Frequency Stabilizers, *Helv. Ph. Ac.*, vol. 16, pp. 207-209, 1943.
24. BANTLE, W., and G. BUSCH: Dielectric Investigations of Rochelle Salt, *Helv. Ph. Ac.*, vol. 10, pp. 261-264, 1937.
25. BANTLE, W., G. BUSCH, B. LAUTERBURG, and P. SCHERRER: The Spontaneous Kerr Effect in KH_2PO_4 and KH_2AsO_4 Crystals, *Helv. Ph. Ac.*, vol. 15, pp. 324-325, 1942.
26. BANTLE, W., and C. CAFLISCH: The Piezoelectric Effect of the KH_2PO_4 Crystal, Akin to Rochelle Salt, *Helv. Ph. Ac.*, vol. 16, pp. 235-250, 1943.
27. BANTLE, W., and W. LÜDY: The Elastic Properties of Seignette-electric Substances, *Helv. Ph. Ac.*, vol. 15, pp. 325-327, 1942.
28. BANTLE, W., B. MATTHIAS, and P. SCHERRER: The Dependence of Piezoelectric Resonant Frequencies of the Seignette-electrics on Field Strength, *Helv. Ph. Ac.*, vol. 16, pp. 209-211, 1943.
29. BANTLE, W., and P. SCHERRER: Anomaly of the Specific Heat of Potassium Dihydrogen Phosphate at the Upper Curie Point, *Nature*, vol. 143, p. 980, 1939.
30. BAUMGARDT, E.: Velocity of Propagation of Elastic Waves in Piezoelectric Crystals, *C.R.*, vol. 206, pp. 1887-1890, 1938.

31. BECHMANN, R.: Development of Quartz Control for the Telefunken High-power Transmitter, *Telef.-Z.*, vol. 14, pp. 17-29, 1933.
32. BECHMANN, R.: The Temperature Coefficients of the Natural Frequencies of Piezoelectric Quartz Plates and Bars, *Hfr. u. El. ak.*, vol. 44, pp. 145-160, 1934.
33. BECHMANN, R.: The Crystal Control of Transmitters, *W.E.*, vol. 11, pp. 249-253, 1934.
34. BECHMANN, R.: Measurement of the Velocity of Sound in Anisotropic Media, Particularly in Quartz, by Means of Piezoelectric Excitation, *ZS. Ph.*, vol. 91, pp. 670-678, 1934.
35. BECHMANN, R.: Investigations on the Elastic Vibrations of Piezoelectrically Excited Quartz Plates, *ZS. tech. Ph.*, vol. 16, pp. 525-528, 1935.
36. BECHMANN, R.: Quartz Oscillators, *Telef.-Z.*, vol. 17, pp. 36-45, 1936.
37. BECHMANN, R.: Quartz Resonators, *Telef.-Z.*, vol. 18, pp. 5-15, 1937.
38. BECHMANN, R.: On Circuits for Piezoelectric Quartz Oscillators and Resonators for Frequency Stabilization and Filters, *Telef. Hausmitt.*, vol. 19, pp. 60-69, March, 1938.
39. BECHMANN, R.: Thickness Vibrations of Piezoelectrically Excited Crystal Plates, *Hfr. u. El. ak.*, vol. 56, pp. 14-21, 1940.
40. BECHMANN, R.: Elastic Vibrations of an Anisotropic Body in the Form of a Rectangular Parallelepiped, *ZS. Ph.*, vol. 117, pp. 180-197, 1941.
41. BECHMANN, R.: Lengthwise Vibrations of Square Quartz Plates, *ZS. Ph.*, vol. 118, pp. 515-538, 1942.
42. BECHMANN, R.: Lengthwise Vibrations of Rectangular Quartz Plates, *ZS. Ph.*, vol. 120, pp. 107-120, 1942.
43. BECHMANN, R.: Properties of Quartz Oscillators and Resonators in the Range from 300 to 5000 kc/s., *Hfr. u. El. ak.*, vol. 59, pp. 97-105, 1942.
44. BECHMANN, R.: Quartz Oscillators and Resonators in the Region from 50 to 300 kc/s., *Hfr. u. El. ak.*, vol. 61, pp. 1-12, 1943.
45. BECKER, H. E. R.: The Reaction of the Surrounding Liquid on the Vibrations of a Quartz Plate, *An. Phk.*, vol. 25, pp. 359-372, 1936.
46. BECKER, H. E. R.: On the Vibration Mechanism of a Quartz Plate in Liquids, *An. Phk.*, vol. 26, pp. 645-658, 1936.
47. BECKERATH, H.: The Vibrating Quartz in Communications Technique. Part I —The Mechanical and Electrical Properties of the Vibrating Quartz (Survey), *ENT*, vol. 19, pp. 45-62, 1942.
48. BEEVERS, C. A., and W. HUGHES: The Crystal Structure of Rochelle Salt (Sodium Potassium Tartrate Tetrahydrate $\text{NaKC}_4\text{H}_4\text{O}_6 \cdot 4\text{H}_2\text{O}$), *Proc. Roy. Soc.*, vol. 177, pp. 251-259, 1941.
49. BENOIT, J.: The Various Modes of Vibration of Piezoelectric Quartz, *L'Onde élec.*, vol. 18, pp. 22-36, 1938.
50. BENSON, J. E.: A Piezoelectric Calibrator, *A.W.A. Tech. Rev.*, vol. 5, pp. 47-50, 1940.
51. BENSON, J. E.: Modes of Vibration and Design of V-cut Quartz Plates for Medium Broadcast Frequencies, *A.W.A. Tech. Rev.*, vol. 6, pp. 73-89, 1943.
52. BERGMANN, L.: A Simple Method for Detecting the Piezoelectricity of Crystals, *Phys. ZS.*, vol. 36, pp. 31-32, 1935; *Zentralblatt f. Mineralogie (A)*, pp. 213-222, 1935.
53. BERGMANN, L.: On the Natural Frequencies of Piezoelectric Quartz Plates When Excited in Thickness Vibration, *An. Phk.*, vol. 21, pp. 553-563, 1935.
54. BIOT, A.: Testing Quartz Plates Cut at Right Angles to the Optic Axis, *Ann. soc. sci. Brux.*, vol. 58, pp. 98-100, 1938.

55. BLOOMENTHAL, S.: The Converse Piezoelectric Effect in Mixed Crystals Iso-morphous with Rochelle Salt, *Physics*, vol. 4, pp. 172-177, 1933.
56. BOELLA, M.: On the Performance of the Piezo-oscillator in Relation to the Resonance Curve of the Quartz, *L'Elettrot.*, vol. 17, pp. 672-678, 1930.
57. BOELLA, M.: Influence of the Decrement of the Quartz on the Oscillation Frequency of Piezo-oscillators, *L'Elettrot.*, vol. 17, pp. 734-736, 1930; *Proc. I.R.E.*, vol. 19, pp. 1252-1273, 1931.
58. BOELLA, M.: Piezo-oscillators with Neutralization of the Quartz, *Alta freq.*, vol. 8, pp. 512-515, 1939.
59. BOGUSLAWSKI, S.: Theory of Dielectrics; Temperature Coefficient of the Dielectric Constants; Pyroelectricity, *Phys. ZS.*, vol. 15, pp. 283-288, 1914.
60. BOGUSLAWSKI, S.: Pyroelectricity on the Basis of the Quantum Theory, *Phys. ZS.*, vol. 15, pp. 569-572, 1914.
61. BOGUSLAWSKI, S.: On W. Ackermann's Measurements of the Temperature Coefficient of Pyroelectric Excitation, *Phys. ZS.*, vol. 15, pp. 805-810, 1914.
62. BOKOVY, S. A.: Quartz Crystals—Development and Application, *Elec. Comm.*, vol. 21, pp. 233-246, 1944.
63. BOND, W. L.: Etch Figures of Quartz, *ZS. Kr.*, vol. 99, pp. 488-498, 1938.
64. BOND, W. L.: The Mathematics of the Physical Properties of Crystals, *Bell Syst. T.J.*, vol. 22, pp. 1-72, 1943.
65. BOND, W. L.: A Mineral Survey for Piezoelectric Materials, *Bell Syst. T.J.*, vol. 22, pp. 145-152, 1943.
66. BOND, W. L.: Methods for Specifying Quartz Crystal Orientation and Its Determination by Optical Means, *Bell Syst. T.J.*, vol. 22, pp. 224-262, 1943.
67. BOND, W. L.: Processing Quartz, *Bell Labs. Rec.*, vol. 22, pp. 359-361, 1944.
68. BOND, W. L., and E. J. ARMSTRONG: The Use of X-rays for Determining the Orientation of Quartz Crystals, *Bell Syst. T.J.*, vol. 22, pp. 293-337, 1943.
69. BOOTH, C. F.: The Application and Use of Quartz Crystals in Telecommunications, *J.I.E.E.*, vol. 88, part 3, pp. 97-128, 1941; discussion, pp. 128-144.
70. BOOTH, C. F., and E. J. C. DIXON: Crystal Oscillators for Radio Transmitters: An Account of Experimental Work Carried Out by the Post Office, *W.E.*, vol. 12, pp. 198-200, 1935; *J.I.E.E.*, vol. 77, pp. 197-236, discussion pp. 237-244, 1935; *Proc. Wireless Sec., I.E.E.*, vol. 10, pp. 129-168, discussion, pp. 169-176, 1935.
71. BOOTH, C. F., and C. F. SAYERS: The Production of Quartz Resonators for the London-Birmingham Coaxial Cable System, *P.O.E.E.J.*, vol. 32, pp. 7-15, 88-93, 1939.
72. BORSARELLI, C.: A New Piezo-oscillator, *Alta freq.*, vol. 5, pp. 763-772, 1936.
73. BOSSHARD, W., and G. BUSCH: The Damping of Piezoelectric Vibrations, *Helv. Ph. Ac.*, vol. 10, pp. 329-330, 1937; *ZS. Ph.*, vol. 108, pp. 195-199, 1938.
74. BOYLE, R. W.: Ultrasonics, *Science Progress*, vol. 23, pp. 75-105, 1928.
75. BRAGG, W., and R. E. GIBBS: The Structure of Alpha- and Beta-quartz, *Proc. Roy. Soc.*, vol. 109, pp. 405-427, 1925.
76. BROWN, H. A.: Oscilloscope Patterns of Damped Vibrations of Quartz Plates and Q Measurements with Damped Vibrations, *Proc. I.R.E.*, vol. 29, pp. 195-199, 1941.
77. BROWN, S. L., and S. HARRIS: Measurements of Temperature Coefficient and Pressure Coefficient of Quartz Crystal Oscillators, *R.S.I.*, vol. 2, pp. 180-183, 1931.
78. BROWN, W. F., JR.: Interpretation of Torsional Frequencies of Crystal Specimens, *Phys. Rev.*, vol. 58, pp. 998-1001, 1940.
79. BÜCKS, K., and H. MÜLLER: On Some Observations of Vibrating Piezo-quartz Plates and Their Acoustic Radiation Field, *ZS. Ph.*, vol. 84, pp. 75-86, 1933.

80. BUILDER, G.: Quartz Crystals for the Control and Measurement of Frequency, *A.W.A. Tech. Rev.*, vol. 2, pp. 104-105, 1936.
81. BUILDER, G.: A Note on the Determination of the Equivalent Electrical Constants of a Quartz-crystal Resonator, *A.W.A. Tech. Rev.*, vol. 5, pp. 41-45, 1940.
82. BUILDER, G., and J. E. BENSON: Precision Frequency-control Equipment Using Quartz Crystals, *A.W.A. Tech. Rev.*, vol. 3, pp. 157-214, 1938; *Proc. World Radio Convention*, Sydney, Australia, 1938.
83. BUILDER, G., and J. E. BENSON: Contour-mode Vibrations in Y-cut Quartz-crystal Plates, *Proc. I.R.E.*, vol. 29, pp. 182-185, 1941; *A.W.A. Tech. Rev.*, vol. 5, pp. 181-189, 1941.
84. BUILDER, G., and J. E. BENSON: Simple Quartz-crystal Filters of Variable Bandwidth, *A.W.A. Tech. Rev.*, vol. 5, pp. 93-103, 1941.
85. BUISSON, H.: Method of Observing the Optical Purity of Quartz Crystals, *J. phq.*, vol. 8, pp. 25-31, 1919.
86. BUNING, DE C.: Quartz Crystals with Low Temperature Coefficients, *Radio-Centrum*, vol. 1, pp. 25-28, 1935.
87. BUSCH, G.: Anomalous Dispersion of the Dielectric Constants of Rochelle Salt, *Helv. Ph. Ac.*, vol. 6, pp. 315-336, 1933.
88. BUSCH, G.: New Seignette-electrics, *Helv. Ph. Ac.*, vol. 11, pp. 269-298, 1938.
89. BUSCH, G., and E. GANZ: Dielectric Measurements on KH_2PO_4 and KH_2AsO_4 at Low Temperatures, *Helv. Ph. Ac.*, vol. 15, pp. 501-508, 1942.
90. BUSCH, G., and P. SCHERRER: A New Seignette-electric Substance, *Naturwiss.*, vol. 23, p. 737, 1935.
91. CADY, W. G.: The Piezoelectric Resonator (abst.), *Phys. Rev.*, vol. 17, p. 531, 1921.
92. CADY, W. G.: Theory of Longitudinal Vibrations of Viscous Rods, *Phys. Rev.*, vol. 19, pp. 1-6, 1922.
93. CADY, W. G.: The Piezoelectric Resonator, *Proc. I.R.E.*, vol. 10, pp. 83-114, 1922.
94. CADY, W. G.: A Method of Testing Plates from Piezoelectric Crystals, *J.O.S.A.*, vol. 6, pp. 183-185, 1922.
95. CADY, W. G.: Piezoelectrically Driven Tuning-forks and Rods, *Phys. Rev.*, vol. 21, pp. 371-372, 1923.
96. CADY, W. G.: An International Comparison of Radio Wavelength Standards by Means of Piezoelectric Resonators, *Proc. I.R.E.*, vol. 12, pp. 805-816, 1924.
97. CADY, W. G.: Piezoelectric Standards of High Frequency, *J.O.S.A.*, vol. 10, pp. 475-489, 1925.
98. CADY, W. G.: A Shear Mode of Crystal Vibration (abst.), *Phys. Rev.*, vol. 29, p. 617, 1927.
99. CADY, W. G.: Bibliography on Piezoelectricity, *Proc. I.R.E.*, vol. 16, pp. 521-535, 1928.
100. CADY, W. G.: Some Electromechanical Properties of Rochelle Salt Crystals (abst.), *Phys. Rev.*, vol. 33, pp. 278-279, 1929.
101. CADY, W. G.: Electroelastic and Pyro-electric Phenomena, *Proc. I.R.E.*, vol. 18, pp. 1247-1262, 1930.
102. CADY, W. G.: Piezoelectric Terminology, *Proc. I.R.E.*, vol. 18, pp. 2136-2142, 1930.
103. CADY, W. G.: Low Frequency Vibrations in Rochelle Salt and Quartz Plates (abst.), *Phys. Rev.*, vol. 39, p. 862, 1932.
104. CADY, W. G.: Quartz Oscillator with Optical Control, *C.R. congrés int. d'élec.*, vol. 11, sec. 9, pp. 40-48, Paris, 1932.

105. CADY, W. G.: The Application of Methods of Geometrical Inversion to the Solution of Certain Problems in Electrical Resonance, *Proc. A.A.A.S.*, vol. 68, pp. 383-409, 1933.
106. CADY, W. G.: The Potential Distribution between Parallel Plates and Concentric Cylinders Due to any Arbitrary Distribution of Space Charge, *Physics*, vol. 6, pp. 10-13, 1935.
107. CADY, W. G.: The Piezoelectric Resonator and the Effect of Electrode Spacing upon Frequency, *Physics*, vol. 7, pp. 237-259, 1936.
108. CADY, W. G.: The Longitudinal Piezoelectric Effect in Rochelle Salt Crystals, *Proc. Ph. Soc.*, vol. 49, pp. 646-653, 1937.
109. CADY, W. G.: A Survey of Piezoelectricity, *A.P.T.*, vol. 6, pp. 227-242, 1938.
110. CADY, W. G., and K. S. VAN DYKE: Proposed Standard Conventions for Expressing the Elastic and Piezoelectric Properties of Right- and Left-quartz, *Proc. I.R.E.*, vol. 30, pp. 495-499, 1942.
111. CHAIKIN, S.: On a Direct Method for the Measurement of Small Decrements of Piezo-crystal Resonators, *Hfr. u. El. ak.*, vol. 35, pp. 6-9, 1930.
112. CLAY, J., and J. KARPER: Piezoelectric Constant of Quartz, *Physica*, vol. 4, pp. 311-315, 1937.
113. CORTEZ, S. H.: Interferometer Method for Measuring the Amplitude of Vibration of Quartz Bar Crystals, *J.O.S.A.*, vol. 24, pp. 127-129, 1934; erratum, vol. 24, p. 194, 1934.
114. COSTER, D., K. S. KNOL, and J. A. PRINS: Differences in Intensity of X-ray Reflection from the Two 111-Faces of Zinc Blende, *ZS. Ph.*, vol. 63, pp. 345-369, 1930.
115. CROSSLEY, A.: Piezoelectric Crystal-controlled Transmitter, *Proc. I.R.E.*, vol. 15, pp. 9-36, 1927.
116. CROSSLEY, A.: Modes of Vibration in Piezoelectric Crystals, *Proc. I.R.E.*, vol. 16, pp. 416-423, 1928.
117. CURIE, J., and P. CURIE: Development by Pressure of Polar Electricity in Hemihedral Crystals with Inclined Faces, *Bull. soc. min. de France*, vol. 3, pp. 90-93, 1880. This paper, read at the meeting of Apr. 8, 1880, contained the first announcement of the discovery of piezoelectricity.
118. CZERMAK, P.: On the Electric Behavior of Quartz, *Ber. Wien*, vol. 96, pp. 1217-1244, 1887.
119. DAVID, R.: The Dependence of the Dielectric Properties of Rochelle Salt on Mechanical Conditions, *Helv. Ph. Ac.*, vol. 8, pp. 431-484, 1935.
120. DAVIES, R. M.: On the Determination of Some of the Elastic Constants of Rochelle Salt by a Dynamical Method, *Phil. Mag.*, vol. 16, pp. 97-124, 1933.
121. DAWSON, L. H.: Piezoelectricity of Crystal Quartz, *Phys. Rev.*, vol. 29, pp. 532-541, 1927.
122. DEBYE, P., and F. W. SEARS: Scattering of Light by Supersonic Waves, *Proc. Nat. Acad. Sci.*, vol. 18, pp. 409-414, 1932.
123. DIJL, B. VAN: The Application of Ricci-calculus to the Solution of Vibration Equations of Piezoelectric Quartz, *Physica*, vol. 3, pp. 317-326, 1936.
124. DOERFFLER, H.: Flexural and Shear Vibrations in Piezoelectrically Excited Quartz Plates, *ZS. Ph.*, vol. 63, pp. 30-53, 1930.
125. DOHERTY, W. H.: Synchronized FM Transmitter, *F.M. Mag.*, vol. 1, pp. 21-25, December, 1940.
126. DRUESNE, M. A. A.: Quartz Crystals, *Communications*, vol. 23, pp. 46f., September, 1943.
127. DYE, D. W.: Piezoelectric Quartz Resonator and Equivalent Electrical Circuit, *Proc. Ph. Soc.*, vol. 38, pp. 399-457; discussion, pp. 457-458, 1926.

128. DYE, D. W.: The Modes of Vibration of Quartz Piezoelectric Plates as Revealed by an Interferometer, *Proc. Roy. Soc.*, vol. 138, pp. 1-16, 1932.
129. ECCLES, W. H., and W. A. LEYSHON: Some New Methods of Linking Mechanical and Electrical Vibrations, *Proc. Ph. Soc.*, vol. 40, pp. 229-232, 1928.
130. EICHHORN, K.: Photoelastic Investigations of the Piezoelectrically Excited Flexural Oscillations of Quartz Bars, *ZS. tech. Ph.*, vol. 17, pp. 276-279, 1936.
131. EKSTEIN, H.: Free Vibrations of Anisotropic Bodies, *Phys. Rev.*, vol. 66, pp. 108-118, 1944.
132. ENGL, J., and I. P. LEVENTER: On a New Method for Measuring the Piezoelectric Effect in Powdered Crystals, *An. Phk.*, vol. 29, pp. 369-385, 1937; abst. in *Naturwiss.*, vol. 24, pp. 217-218, 1936.
133. EREMEEV, M., and B. KURCHATOV: Electric Properties of the Isomorphic Crystals $\text{NaKC}_4\text{H}_4\text{O}_6 \cdot 4\text{H}_2\text{O}$ and $\text{NaNH}_4\text{C}_4\text{H}_4\text{O}_6 \cdot 4\text{H}_2\text{O}$, *Phys. ZS. d. Sowjetunion*, vol. 3, pp. 304-320, 1933; *J. Exp. Th. Ph. U.S.S.R.*, vol. 2, pp. 329-338, 1932.
134. ERRERA, J.: Dispersion of Hertz Waves in Solids, *Phys. ZS.*, vol. 32, pp. 369-373, 1931.
135. ESSEN, L.: Description of the Quartz Control of a Transmitter at 1785 Kilocycles per Second, *J.I.E.E.*, vol. 74, pp. 595-597, 1934; *Proc. Wireless Sec., I.E.E.*, vol. 9, pp. 167-169, 1934.
136. ESSEN, L.: Examples of the Electrical Twinning of Quartz, *J. Sci. Instr.*, vol. 12, pp. 256-257, 1935.
137. ESSEN, L.: Oscillations of Hollow Quartz Cylinders, *Nature*, vol. 135, p. 1076, 1935.
138. ESSEN, L.: The Dye Quartz Ring Oscillator as a Standard of Frequency and Time, *Proc. Roy. Soc.*, vol. 155, pp. 498-519, 1936.
139. ESSEN, L.: A New Form of Frequency and Time Standard, *Proc. Ph. Soc.*, vol. 50, pp. 413-423; discussion, pp. 423-426, 1938.
140. EVANS, R. C.: The Dielectric Constant of Mixed Crystals of Sodium Ammonium and Sodium Potassium Tartrates, *Phil. Mag.*, vol. 24, pp. 70-79, 1937.
141. FAIR, I. E.: Using High Crystal Harmonics for Oscillator Control, *Bell Labs. Rec.*, vol. 21, pp. 237-242, 1943.
142. FOWLER, R. H.: A Theory of the Rotations of Molecules in Solids and of the Dielectric Constants of Solids and Liquids, *Proc. Roy. Soc.*, vol. 149, pp. 1-28, 1935.
143. FOX, G. W., and G. A. FINK: The Piezoelectric Properties of Quartz and Tourmaline, *Physics*, vol. 5, pp. 302-306, 1934.
144. FOX, G. W., and W. G. HUTTON: Experimental Study of Parallel-cut Piezoelectric Quartz Plates, *Physics*, vol. 2, pp. 443-447, 1932.
145. FOX, F. E., and G. D. ROCK: The Ultrasonic Radiation Field of a Quartz Disk Radiating into Liquid Media, *Phys. Rev.*, vol. 54, pp. 223-228, 1938.
146. FOX, F. E., and G. D. ROCK: An Ultrasonic Source of Improved Design: Optical Studies of Ultrasonic Waves in Liquids, *R.S.I.*, vol. 9, pp. 341-345, 1938.
147. FOX, F. E., and G. D. ROCK: A Quartz Plate with Coupled Liquid Column as a Variable Resonator, *Proc. I.R.E.*, vol. 30, pp. 29-33, 1942.
148. FOX, G. W., and M. UNDERWOOD: On the Piezoelectric Properties of Tourmaline, *Physics*, vol. 4, pp. 10-13, 1933.
149. FRAYNE, J. G.: Reversible Inductivity of Rochelle Salt Crystals, *Phys. Rev.*, vol. 21, pp. 348-359, 1923.
150. FRÉEDERICKSZ, V., and G. MIKHAILOV: The Dependence of the Piezoelectric Constant of Quartz upon Temperature, *ZS. Ph.*, vol. 76, pp. 328-336, 1932.
151. FRIEDEL, G.: On the Forms of Quartz Crystals, *Bull. soc. min. fr.*, vol. 46, pp. 79-95, 1923.

152. FUJIMOTO, T.: On the Determination of the Piezoelectric Constant of a Quartz Resonator at High Frequency, *Proc. World Eng. Cong., Tokyo, Paper 369*, pp. 399-416, 1929.
153. GALOTTI, F.: Luminous Quartz Resonators, *Alta freq.*, vol. 6, pp. 809-824, 1937.
154. GAUDEFROY, C.: Orientation of Crystals, Especially Quartz, by Means of Etch Figures, *C.R.*, vol. 192, pp. 1113-1116, 1931.
155. GAUGAIN, J. M.: Note on the Electricity of Tourmaline, *An. chim. phys.*, vol. 57, pp. 5-39, 1859.
156. GERTH, F., and H. ROCHOW: The Temperature Dependence of the Frequency of Quartz Resonators, *ENT*, vol. 5, pp. 549-551, 1928.
157. GIBBS, R. E.: Structure of Alpha Quartz, *Proc. Roy. Soc.*, vol. 110, pp. 443-455, 1926.
158. GIBBS, R. E., and V. N. THATTE: Temperature Variation of the Frequency of Piezoelectric Oscillations of Quartz, *Phil. Mag.*, vol. 14, pp. 682-694, 1932.
159. GIBBS, R. E., and L. C. TSIEN: The Production of Piezoelectricity by Torsion, *Phil. Mag.*, vol. 22, pp. 311-322, 1936.
160. GIEBE, E.: Luminous Piezoelectric Resonators as High-frequency Standards, *ZS. tech. Ph.*, vol. 7, p. 235, 1926.
161. GIEBE, E., and E. BLECHSCHMIDT: Experimental and Theoretical Investigations on Extensional Vibrations of Rods and Tubes, I, *An. Phk.*, vol. 18, pp. 417-456; II, *An. Phk.*, vol. 18, pp. 457-485, 1933.
162. GIEBE, E., and E. BLECHSCHMIDT: On Torsional Vibrations of Quartz Rods and Their Use as Standards of Frequency, *Hfr. u. El. ak.*, vol. 56, pp. 65-87, 1940.
163. GIEBE, E., and A. SCHEIBE: Luminous Effects of High-frequency Longitudinal Vibrations in Piezoelectric Crystals, *ZS. Ph.*, vol. 33, pp. 335-344, 1925.
164. GIEBE, E., and A. SCHEIBE: A Simple Method for Qualitative Indication of Piezoelectricity of Crystals, *ZS. Ph.*, vol. 33, pp. 760-766, 1925.
165. GIEBE, E., and A. SCHEIBE: Luminous Piezoelectric Resonators as High-frequency Standards, *ETZ*, vol. 47, pp. 380-385, 1926.
166. GIEBE, E., and A. SCHEIBE: Piezoelectric Excitation of Elastic Vibrations, *ZS. Hfr.*, vol. 30, pp. 32-33, 1927.
167. GIEBE, E., and A. SCHEIBE: Activity of the Phys.-tech. Reichsanstalt in the Year 1926, *ZS. Instr.*, vol. 46, pp. 269-297, June, 1927.
168. GIEBE, E. and A. SCHEIBE: Piezoelectric Crystals as Standards of Frequency, *ENT*, vol. 5, pp. 65-82, 1928.
169. GIEBE, E., and A. SCHEIBE: Piezoelectric Excitation of Extensional, Flexural, and Torsional Vibrations of Quartz Rods, *ZS. Ph.*, vol. 46, pp. 607-652, 1928.
170. GIEBE, E., and A. SCHEIBE: Flexurally Vibrating Luminous Resonators as Frequency Standards in the Range from 1000 to 20000 Hertz, *ZS. Hfr.*, vol. 35, pp. 165-177, 1930.
171. GIEBE, E., and A. SCHEIBE: On the Series Relationships of the Natural Elastic Frequencies of Quartz Rods, *An. Phk.*, vol. 9, pp. 93-175, 1931.
172. GIEBE, E., and A. SCHEIBE: On Luminous Resonators as Standards of High Frequency, *Hfr. u. El. ak.*, vol. 41, pp. 83-96, 1933.
173. GOCKEL, H.: Decrement of Damping in Piezoelectric Crystals, *Phys. ZS.*, vol. 37, pp. 657-659, 1936.
174. GOEDECKE, H.: The Dielectric Constant of Rochelle Salt in an Electric Field, as a Function of Time, *ZS. Ph.*, vol. 94, pp. 574-589, 1935.
175. GOENS, E.: Determination of Young's Modulus from Flexural Oscillations, *An. Phk.*, vol. 11, pp. 649-678, 1931.
176. GOENS, E.: On Flexural and Torsional Vibrations of a Thin Crystal Rod of any Crystallographic Orientation, *An. Phk.*, vol. 15, pp. 455-484, 1932.

177. GOENS, E.: On the Calculation of Velocity of Propagation of Elastic Waves in Crystals, *An. Phk.*, vol. 29, pp. 279-285, 1937.
178. GOLAY, M. J. E.: A Rochelle Salt Electrometer, *R.S.I.*, vol. 8, pp. 228-230, July, 1937.
179. GOODMAN, B.: Keying the Crystal Oscillator, *QST*, vol. 25, pp. 10-13, May, 1941.
180. GRAMONT, A. DE: On the Movements of a Quartz Crystal in an Electrostatic Field, *C.R.*, vol. 196, pp. 1705-1707, 1933.
181. GRAMONT, A. DE: On Various Types of Vibration of a Quartz Parallelepiped, *C.R.*, vol. 197, pp. 101-103, 1933.
182. GRAMONT, A. DE: Clock Controlled by Means of Piezoelectric Quartz, *An. fr. chron.*, no. 1, pp. 37-43, 1937.
183. GRAMONT, A. DE, and D. BÉRETZKI: A New Method for Temperature Control of Quartz Crystals, *ETZ*, vol. 53, pp. 1039-1040, 1932.
184. GRAMONT, A. DE, and D. BÉRETZKI: Stabilization of Beat Frequency by Temperature-coefficient Compensation, *C.R.*, vol. 200, pp. 1558-1560, 1935.
185. GRAMONT, A. DE, and D. BÉRETZKI: On the Generation of Acoustic Waves by Means of Piezoelectric Quartz, *C.R.*, vol. 202, pp. 1229-1232, 1936.
186. GRAMONT, A. DE, and D. BÉRETZKI: Determination of the Area of a Piezoelectric Plate as Function of Frequency (optimal ratio of diameter to thickness for high-frequency piezo-oscillators), *C.R.*, vol. 204, pp. 459-462, 1937.
187. GRANT, K.: High-frequency Interruption of Light, *Nature*, vol. 120, p. 586, 1927.
188. GREENIDGE, R. M. C.: The Mounting and Fabrication of Plated Quartz Crystal Units, *Bell Syst. T.J.*, vol. 23, pp. 234-259, 1944.
189. GROSSMANN, E., and M. WIEN: On the Effect of Surroundings on the Frequency of a Quartz Resonator, *Phys. ZS.*, vol. 32, pp. 377-378, 1931.
190. GROTH, E. J., and L. N. LIEBERMANN: Precision Measurement of the Velocity of Sound at Supersonic Frequencies Using a Microphone (abstr.), *Phys. Rev.*, vol. 65, p. 350, 1944.
191. GRUETZMACHER, J.: Piezoelectric Crystal with Very Low Natural Frequency, *ENT*, vol. 12, p. 257, 1935.
192. GRUETZMACHER, J.: Piezoelectric Crystal with Ultrasonic Convergence, *ZS. Ph.*, vol. 96, pp. 342-349, 1935.
193. GRUETZMACHER, J.: Directed Supersonic Radiator, *ZS. tech. Ph.*, vol. 17, pp. 166-167, 1936.
194. GÜNTHER, N.: Investigation of the Effect of Mechanical and Electrical Forces on the Double Refraction of Quartz, *An. Phk.*, vol. 13, pp. 783-801, 1932.
195. GÜNTHER, R.: On a Measurement of the Equivalent Electrical Constants of Piezoelectric Crystals, *Hfr. u. El. ak.*, vol. 45, pp. 185-186, 1935.
196. GÜNTHER, R.: The Equivalent Electrical Constants of Piezoelectric Crystals and Their Measurement, *Hfr. u. El. ak.*, vol. 50, pp. 200-203, 1937.
197. GÜNTHER, R.: The Internal Friction in Quartz Crystals, *ENT*, vol. 16, pp. 53-62, 1939.
198. HABLÜTZEL, J.: Anomalous Expansion of Rochelle Salt, *Helv. Ph. Ac.*, vol. 8, pp. 498-499, 1935.
199. HABLÜTZEL, J.: Dielectric Investigations of Heavy-water Rochelle Salt, *Helv. Ph. Ac.*, vol. 12, pp. 489-510, 1939.
200. HANDEL, P. von: Investigations of Quartz-controlled Oscillations, *ENT*, vol. 7, pp. 34-40, 1930.
201. HANDEL, P. von: Investigations of the Behavior of Quartz-controlled Transmitters, *Luftfahrt-F.*, vol. 8, pp. 121-140, 1930.

202. HANDEL, P. von, K. KRÜGER, and H. PLENDL: Quartz Control for Frequency Stabilization in Short-wave Receivers, *Proc. I.R.E.*, vol. 18, pp. 307-320, 1930; *Hfr. u. El. ak.*, vol. 34, pp. 12-18, 1929.
203. HANKEL, W. G.: Following are references to a few of the more important of Hankel's many papers on pyro- and piezoelectricity. Abstracts of all are in *ZS. Kr. und Neues Jahrb. Min.* (a) *Abh. Sächs.*, vol. 10, pp. 345f., 1872. (b) *Abh. Sächs.*, vol. 12, pp. 457-548, 1881. (c) *Abh. Sächs.*, vol. 12, pp. 549-596, 1882. (d) *Abh. Sächs.*, vol. 24, pp. 467-497, 1899. (e) *Ber. Sächs.*, vol. 33, pp. 52-63, 1881. (f) *An. Phk.*, vol. 10, pp. 618f., 1880. (g) *An. Phk.*, vol. 19, pp. 818-844, 1883. It was in papers (b) and (e) that the term "piezoelectricity" was introduced.
204. HARDING, J. W., and F. W. G. WHITE: On the Modes of Vibration of a Quartz Crystal, *Phil. Mag.*, vol. 8, pp. 169-179, 1929.
205. HARRISON, J. R.: Piezoelectric Resonance and Oscillatory Phenomena with Flexural Vibrations in Quartz Plates, *Proc. I.R.E.*, vol. 15, pp. 1040-1054, 1927.
206. HARRISON, J. R.: Piezoelectric Oscillator Circuits with Four-electrode Tubes, *Proc. I.R.E.*, vol. 16, pp. 1455-1467, 1928; discussion, pp. 1467-1470.
207. HARRISON, J. R.: Push-pull Piezoelectric Oscillator Circuits, *Proc. I.R.E.*, vol. 18, pp. 95-100, 1930.
208. HARRISON, J. R., and I. P. HOOPER: The Striated Luminous Glow of the Piezoelectric Quartz Resonator at Flexural Vibration Frequencies, *Phys. Rev.*, vol. 55, p. 674, 1939.
209. HATAKEYAMA, K.: Frequency Variation of Quartz Resonator Due to Heating by Its Vibration, *J.I.T.T.E. Jap.*, no. 109, pp. 522-532, 1932; *R.R.R.W. Jap.*, vol. 2, supp., p. 6, 1932.
210. HAYASHI, F.: Observations on Pyroelectricity, dissertation, Göttingen, 48 pp., 1912.
211. HAYASI, T., and S. AKASI: Quick Building-up of the Electron-coupled Quartz Oscillator, *Electrotech. Jour. (Jap.)*, vol. 3, pp. 219-222, 1939.
212. HEATON, V. E., and E. G. LAPPHAM: Quartz Plate Mountings and Temperature Control for Piezo Oscillators, *Proc. I.R.E.*, vol. 20, pp. 261-271, 1932; discussion, p. 1064; *J. Res. N.B.S.*, vol. 7, pp. 683-690, 1931.
213. HECKMANN, G.: The Lattice Theory of Solids, *Ergeb. exakt. Naturwiss.*, vol. 4, pp. 100-153, 1925.
214. HEEGNER, K.: On Measurements with Piezoelectric Crystals, *ZS. Hfr.*, vol. 29, pp. 177-180, 1927.
215. HEEGNER, K.: On the Pierce Crystal Oscillator, *ENT*, vol. 10, pp. 357-371, 1933.
216. HEEGNER, K.: Coupled Self-excited Circuits and Crystal Oscillators, *ENT*, vol. 15, pp. 359-368, 1938.
217. HEHLGANS, F. W.: On Plates of Piezoelectric Quartz as Transmitters and Receivers of High-frequency Sound-waves, *An. Phk.*, vol. 86, pp. 587-627, 1928.
218. HEIERLE, J.: The Frequency Constancy of Tourmaline-controlled Ultra-short-wave Transmitters, *Helv. Ph. Ac.*, vol. 10, pp. 345-346, 1937.
219. HENDERSON, J. T.: Properties of Tourmaline Crystals Used as Piezoelectric Resonators, *Trans. Roy. Soc. Can.*, vol. 22, pp. 127-131, 1928.
220. HERLINGER, E.: On a New Photogoniometer, *ZS. Kr.*, vol. 66, pp. 282-296, 1927.
221. HETTICH, A.: Piezoelectric Experiments According to the Principle of the Method of Giebe and Scheibe, *ZS. Ph.*, vol. 65, pp. 506-511, 1930.
222. HETTICH, A.: On Ammonium Salts at Low Temperatures, *ZS. ph. Chem. A*, vol. 168, pp. 353-362, 1933.

223. HETTICH, A., and A. SCHLEEDE: Polarity and Piezoelectric Excitation, *ZS. Ph.*, vol. 46, pp. 147-148, 1927.
224. HETTICH, A., and A. SCHLEEDE: Contributions to the Methods for Determining Crystal Classes, *ZS. Ph.*, vol. 50, pp. 249-265, 1928.
225. HIGHT, S. C.: Wind from Quartz Crystals, *Bell Labs. Rec.*, vol. 14, pp. 121-123, 1935.
226. HIGHT, S. C.: Quartz Plates for Frequency Sub-standards, *Bell Labs. Rec.*, vol. 16, pp. 21-25, 1937.
227. HIGHT, S. C., and G. W. WILLARD: A Simplified Circuit for Frequency Sub-standards Employing a New Type of Low-frequency Zero-temperature-coefficient Quartz Crystal, *Proc. I.R.E.*, vol. 25, pp. 549-563, 1937.
228. HILTSCHER, R.: Piezoelectric Vibration Experiments with Rochelle Salt Crystals, *ZS. Ph.*, vol. 104, pp. 672-680, 1937.
229. HINZ, H.: Elastic Deformations of Rochelle Salt, *ZS. Ph.*, vol. 111, pp. 617-632, 1939.
230. HITCHCOCK, R. C.: The Dimensions of Low-frequency Quartz Oscillators, *R.S.I.*, vol. 1, pp. 13-21, 1930.
231. HOLDEN, A. N., and W. P. MASON: Constants of Heavy-water Rochelle Salt, *Phys. Rev.*, vol. 57, pp. 54-56, 1940.
232. HOLMAN, W. F.: Piezoelectric Excitation of Cane Sugar, *An. Phk.*, vol. 29, pp. 160-178, 1909.
233. HOLTON, G. J.: Rodometric Examination of Quartz Crystals, *Electronics*, vol. 17, pp. 114f., 1944. U.S. Pat. No. 2,374,543.
234. HORTON, J. W., and W. A. MARRISON: Precision Determination of Frequency, *Proc. I.R.E.*, vol. 16, pp. 137-154, 1928.
235. HOVGAARD, O. M.: Application of Quartz Plates to Radio Transmitters, *Proc. I.R.E.*, vol. 20, pp. 767-782, 1932.
236. HUBBARD, J. C.: The Acoustic Resonator Interferometer, I, *Phys. Rev.*, vol. 38, pp. 1011-1019, 1931; II, *Phys. Rev.*, vol. 41, pp. 523-535, 1932; *errata*, vol. 46, p. 525, 1934.
237. HUBBARD, J. C.: Ultrasonics—A Survey, *Am. Jour. Phys.*, vol. 8, pp. 207-221, 1940.
238. HUND, A.: Uses and Possibilities of Piezoelectric Oscillators, *Proc. I.R.E.*, vol. 14, pp. 447-469, 1926.
239. HUND, A.: Notes on Quartz Plates, Air Gap Effect and Audio-frequency Generation, *Proc. I.R.E.*, vol. 16, pp. 1072-1078, 1928.
240. HUND, A.: Generator for Audio Currents of Adjustable Frequency with Piezoelectric Stabilization, *Sci. Pap. Bur. St.*, vol. 22, pp. 631-637, 1928 (No. 569); *QST fr.*, vol. 9, pp. 16-19, 1928.
241. HUND, A.: Note on a Piezoelectric Generator for Audiofrequencies, *J. Res. N.B.S.*, vol. 2, pp. 355-358, 1929.
242. HUND, A., and R. B. WRIGHT: New Piezo-oscillations with Quartz Cylinders Cut along the Optical Axis, *Proc. I.R.E.*, vol. 18, pp. 741-761, 1930; *J. Res. N.B.S.*, vol. 4, pp. 383-394, 1930.
243. ISELEY, F. C.: The Relation between the Mechanical and Piezoelectrical Properties of a Rochelle Salt Crystal, *Phys. Rev.*, vol. 24, pp. 569-574, 1924.
244. JACKSON, C. H.: Development of an Improved Crystal Exciter Unit, *Civil Aeronautics Authority (U.S.A.)*, *Tech. Development Rept.* 26, pp. 1-14, July, 1940.
245. JAFFE, H.: Polymorphism of Rochelle Salt, *Phys. Rev.*, vol. 51, pp. 43-47, 1937.
246. JAFFE, H.: Crystalline Transitions and Dielectric Constant (abst.), *Phys. Rev.*, vol. 53, p. 917, 1938.

247. JEFFERSON, H.: The Pierce Piezoelectric Oscillator, *W.E.*, vol. 18, pp. 232-237, 1941.
248. JIMBO, S.: An International Comparison of Frequency by Means of a Luminous Quartz Resonator, *Proc. I.R.E.*, vol. 18, pp. 1930-1934, 1930; *Elec. Rev. (Jap.)*, vol. 18, pp. 185-194, 1930; *Researches Electrotech. Lab., Tokyo*, March, 1930.
249. KAMAYACHI, Z., and H. WATANABE: On Ultra-short-wave Quartz Crystal Vibrators, *Electrotech. Jour. (Jap.)*, vol. 5, pp. 19-20, 1941.
250. KAMIENSKI, S.: Spherical Piezoelectric Resonators, *Wiadomosci i Prace (WPPI)*, vol. 7, pp. 54-58, 1936.
251. KAMMER, E. W., and J. V. ATANASOFF: A Determination of the Elastic Constants of Beta-quartz, *Phys. Rev.*, vol. 62, pp. 395-400, 1942.
252. KAO, P. T.: Relaxation Oscillations Produced by a Quartz Piezoelectric Oscillator, *C.R.*, vol. 191, pp. 932-934, 1930.
253. KAO, P. T.: A Phenomenon Produced in Polarized Light by Quartz in Vibration, *C.R.*, vol. 200, pp. 563-565, 1935.
254. KARCHER, J. C.: A Piezoelectric Method for the Instantaneous Measurement of High Pressures, *Sci. Pap. Bur. St.*, vol. 18, pp. 257-264, 1922 (No. 445); *J. Frank. Inst.*, vol. 194, pp. 815-816 (abst.), 1922.
255. KELLER, H.: Piezoelectric Flexural Strip as an Electromechanical Transducer, *Hfr. u. El. ak.*, vol. 60, pp. 5-10, 1942.
256. KELVIN, LORD: On the Piezoelectric Property of Quartz, *Phil. Mag.*, vol. 36, pp. 331, 342, 384, 453, 1893.
257. KEYS, D. A.: Adiabatic and Isothermal Piezoelectric Constants of Tourmaline, *Phil. Mag.*, vol. 46, pp. 999-1001, 1923.
258. KHOL, F.: A Method for the Measurement of Elastic Constants, *ZS. Ph.*, vol. 108, pp. 225-231, 1938.
259. KHOL, F.: Elastic Constants and Phase Velocities of Transverse and Longitudinal Waves, *ZS. Ph.*, vol. 111, pp. 450-453, 1939.
260. KISHPAUGH, A. W., and R. E. CORAM: Low Power Radio Transmitters for Broadcast Requirements for 100 to 1000 Watts, *Proc. I.R.E.*, vol. 21, pp. 212-227, 1933.
261. KLUGE, M., and H. SCHÖNFELD: Electric Barkhausen Effect in Rochelle Salt Crystals, *Naturwiss.*, vol. 21, p. 194, 1933.
262. KNOL, K. S.: Measurement of the Piezoelectric Modulus of Zinc Blende, *Konink. Akad. Amst.*, vol. 35, pp. 99-106, 1932.
263. KOBEKO, P., and I. KURCHATOV: Dielectric Properties of Rochelle Salt Crystals, *ZS. Ph.*, vol. 66, pp. 192-205, 1930; *J. Russ. Ph.-Chem. Soc.*, vol. 62, p. 251, 1930.
264. KOBEKO, P., and J. G. NELIDOV: The Discontinuity in the Specific Heat of Rochelle Salt, *Phys. ZS. d. Sowjetunion*, vol. 1, pp. 382-386, 1932.
265. KOBZAREV, J.: On the Parameters of Piezoelectric Resonators, *J. Appl. Ph. (Russian)*, vol. 6, pp. 17-37, 1929.
266. KOGA, I.: On the Piezoelectric Oscillator, *Denki Hyoron*, vol. 15, p. 547, 1927.
267. KOGA, I.: Tuning Fork Made of Quartz Crystal, *J.I.E.E. (Japan)*, vol. 48, p. 100, 1928; *Rep. El. Res. Inst. Tokyo*, series 1, pp. 213-221, 1928.
268. KOGA, I.: Characteristics of Piezoelectric Quartz Oscillators, *Proc. I.R.E.*, vol. 18, pp. 1935-1959, 1930.
269. KOGA, I.: Note on the Piezoelectric Quartz Oscillating Crystal Regarded from the Principle of Similitude, *Proc. I.R.E.*, vol. 19, pp. 1022-1023, 1931.
270. KOGA, I.: Thickness Vibrations of Piezoelectric Oscillating Crystals, *Physics*, vol. 3, pp. 70-80, 1932; *R.R.R.W. Jap.*, vol. 2, pp. 157-173, 1932; *J.I.T.T.E. Jap.*, no. 115, pp. 1223-1253, 1932.

271. KOGA, I.: Vibration of Piezoelectric Oscillating Crystal, *Phil. Mag.*, vol. 16, pp. 275-283, 1933.
272. KOGA, I.: Thermal Characteristics of Piezoelectric Oscillating Quartz Plates, *U.R.S.I. Gen. Assembly, Document 33, Comm. I*, London, 1934; *R.R.R.W. Jap.*, vol. 4, pp. 61-76, 1934.
273. KOGA, I.: On the Temperature-coefficients of Quartz Plates for Long Waves, *ENT*, vol. 12, pp. 1-2, 1935.
274. KOGA, I.: Notes on Piezoelectric Quartz Crystals, *Proc. I.R.E.*, vol. 24, pp. 510-531, 1936.
275. KOGA, I.: Young's Modulus of a Crystal in any Direction, *Proc. I.R.E.*, vol. 24, pp. 532-533, 1936.
276. KOGA, I.: Vibrating Piezoelectric Quartz Plates without Variation of Frequency with Temperature, *L'Onde élec.*, vol. 15, pp. 457-468, 498-507, 1936.
277. KOGA, I.: A Portable Standard Frequency Oscillator, *R.R.R.W. Jap.*, vol. 7, pp. 219-225, 1937.
278. KOGA, I.: An Ultra-short-wave Quartz Crystal Oscillator, *R.R.R.W. Jap.*, vol. 7, pp. 227-229, 1937.
279. KOGA, I.: Equivalence of Two Piezoelectric Oscillating Quartz Crystals of Symmetrical Outlines with Respect to a Plane Perpendicular to an Electrical Axis, *Phil. Mag.*, vol. 27, pp. 640-643, 1939.
280. KOGA, I.: Variable Resistance Device and Its Application Especially to the Frequency Modulation of Quartz Crystal Oscillator, *Electrotech. Jour. (Jap.)*, vol. 4, no. 5, pp. 99-107, 1940.
281. KOGA, I., and M. SHOYAMA: Contour Vibration of Rectangular X-cut Oscillating Quartz Plate, *J.I.E.E. (Japan)*, vol. 56, p. 852, 1936.
282. KOGA, I., and M. SHOYAMA: Transient Frequency Variation of Crystal Oscillator (abst.), *R.R.R.W. Jap.*, vol. 8, p. 6, 1938; *Electrotech. Jour. (Jap.)*, vol. 2, pp. 199-201, 1938.
283. KOGA, I., and M. TATIBANA: Anomalies of Thickness Vibration of Quartz Plates Due to Non-uniform Thickness, *Electrotech. Jour. (Jap.)*, vol. 3, pp. 81-85, 1939.
284. KOGA, I., and W. YAMAMOTO: Beat-frequency Crystal Oscillator, *Electrotech. Jour. (Jap.)*, vol. 4, pp. 134-137, 1940.
285. KOGA, I., W. YAMAMOTO, H. NISIO, O. HARASIMA, and S. IKEZAWA: 250-Watt Pentode Crystal Oscillator, *Electrotech. Jour. (Jap.)*, vol. 3, pp. 92-94, 1939.
286. KOLENKO, B. VON: Pyroelectricity of Quartz with Respect to Its Crystalline System, *ZS. Kr.*, vol. 9, pp. 1-28, 1884.
287. KÖRNER, H.: Growing Rochelle-salt Crystals for Reproducible Measurements, *ZS. Ph.*, vol. 94, pp. 801-807, 1935.
288. KÖRNER, H.: Dielectric Constant, Conductivity and Piezo-effect of Rochelle-salt Crystals, *ZS. Ph.*, vol. 103, pp. 170-190, 1936.
289. KOTLYAREVSKI, M. L., and E. YA. PUMPER: Investigations of the Oscillations of Piezo-quartz Plates by the Interferometer Method, *J. Ph. U.S.S.R.*, vol. 4, pp. 67-78, 1941.
290. KRISTA, F.: Dependence of the Velocity of Propagation of Flexural Vibrations upon Frequency, *ZS. Ph.*, vol. 112, pp. 326-338, 1939.
291. KÜHNHOLD, W.: The Control by Means of Tourmaline Crystals of Ultra-short Waves Excited in any Type of Circuit, *Hfr. u. El. ak.*, vol. 46, pp. 82-85, 1935.
292. KURCHATOV, B., and M. EREMEEV: On the Electrical Properties of Rochelle-salt Mixed Crystals, *Phys. ZS. d. Sowjetunion*, vol. 1, pp. 140-154, 1932.
293. KURCHATOV, B., and I. KURCHATOV: The Lower Curie-point in Rochelle Salt, *Phys. ZS. d. Sowjetunion*, vol. 3, pp. 321-334, 1933.

294. KURCHATOV, I.: Unipolarity of Polarization in Rochelle-salt Crystals, *Phys. ZS. d. Sowjetunion*, vol. 4, pp. 125-129, 1933.
295. KURCHATOV, I.: Rochelle Salt in the Region of Spontaneous Orientation, *Phys. ZS. d. Sowjetunion*, vol. 5, pp. 200-211, 1934.
296. KURCHATOV, I., and A. SHAKIROV: Inversion Phenomena in the Polarization of Rochelle Salt, *Phys. ZS. d. Sowjetunion*, vol. 7, pp. 631-638, 1935 (in German). KURTSCHATOW—see KURCHATOV.
297. KUSUNOSE, Y., and S. ISHIKAWA: Frequency Stabilization of Radio Transmitters, *Proc. I.R.E.*, vol. 20, pp. 310-339, 1932; *R.R.R.W. Jap.*, vol. 1, pp. 157-183, 1931.
298. LACK, F. R.: Observations on Modes of Vibration and Temperature-coefficients of Quartz Crystal Plates, *Proc. I.R.E.*, vol. 17, pp. 1123-1141, 1929; *Bell Syst. T.J.*, vol. 8, pp. 515-535, 1929.
299. LACK, F. R., G. W. WILLARD, and I. E. FAIR: Some Improvements in Quartz Crystal Circuit Elements, *Bell Syst. T.J.*, vol. 13, pp. 453-463, 1934.
300. LAMB, J. J.: A More Stable Crystal Oscillator of High Harmonic Output, *QST*, vol. 17, pp. 30-32, June, 1933.
301. LAMB, J. J.: Tritet Multi-band Crystal Control, *QST*, vol. 17, pp. 9-15, October, 1933.
302. LAMB, J. J.: A Practical Survey of Pentode and Beam Tube Crystal Oscillators for Fundamental and Second Harmonic Output, *QST*, vol. 21, pp. 31-38, 106, 107, April, 1937.
303. LANE, C. T.: Magnetic Properties of Rochelle Salt, *Phys. Rev.*, vol. 45, p. 66, 1934.
304. LANGEVIN, A.: On the Variation of the Piezoelectric Modulus of Quartz with Temperature, *J. phq.*, vol. 7, pp. 95-100, 1936.
305. LANGEVIN, A.: Absolute Value of the Principal Piezoelectric Modulus of Quartz, *C.R.*, vol. 209, pp. 627-630, 1939.
306. LANGEVIN, A., and A. MOULIN: On the Variation of the Piezoelectric Modulus of Quartz with Temperature, *J. phq.*, vol. 8, pp. 257-259, 1937.
307. LANGEVIN, P., and J. SOLOMON: On the Laws of the Liberation of Electricity by Torsion in Piezoelectric Bodies, *C.R.*, vol. 200, pp. 1257-1260, 1935.
308. LARMOR, J.: Electro-crystalline Properties as Conditioned by Atomic Lattices, *Proc. Roy. Soc.*, vol. 99, pp. 1-10, 1921.
309. LAUE, M. v.: Piezoelectrically Excited Vibrations of Quartz Rods, *ZS. Ph.*, vol. 34, pp. 347-361, 1925.
310. LAWSON, A. W.: The Piezoelectricity of Beta-quartz, *Science*, vol. 92, p. 419, 1940.
311. LAWSON, A. W.: A Determination of the Elastic Modulus s_{13} of Beta-quartz, *Phys. Rev.*, vol. 59, pp. 608-612, 1941.
312. LAWSON, A. W.: Comment on the Elastic Constants of Alpha-quartz, *Phys. Rev.*, vol. 59, p. 838, 1941.
313. LAWSON, A. W.: The Vibration of Piezoelectric Plates, *Phys. Rev.*, vol. 62, pp. 71-76, 1942.
314. LEITHÄUSER, G., and V. PETRZILKA: On Standards for Measurement of Ultra-short Waves, *Funktech. Mon.*, no. 9, 1932.
315. LE QUÉRÉ, H.: An Apparatus Designed for the Determination of the Pyroelectric Effect, *Bull. soc. min. fr.*, vol. 59, pp. 137-142, 1936.
316. LIPPmann, G.: Principle of the Conservation of Electricity, *C.R.*, vol. 92, pp. 1049-1051, 1149-1152, 1881; *J. phq.*, vol. 10, pp. 381-394, 1881; *An. chim. phys.*, ser. 5, vol. 24, pp. 145-178, 1881 (prediction of the converse piezoelectric effect).

317. LISSÜTIN, A.: The Vibrations of a Quartz Plate, *ZS. Ph.*, vol. 59, pp. 265-273, 1930.
318. LLEWELLYN, F. B.: Constant Frequency Oscillators, *Bell Syst. T.J.*, vol. 11, pp. 67-100, 1932; *Proc. I.R.E.*, vol. 19, pp. 2063-2094, 1931.
319. LÖNN, E.: Theory of Oscillation of Crystal Plates, *An. Phk.*, vol. 30, pp. 420-432, 1937.
320. LUCAS, H. J.: Some Developments of the Piezoelectric Crystal as a Frequency Standard, *J.I.E.E. (London)*, vol. 68, pp. 855-872, 1930; reprinted in *Wireless Section*, vol. 5, pp. 151-163, 1930; discussion, pp. 163-168.
321. LUCAS, R., and P. BIQUARD: New Optical Properties of Liquids Subjected to Ultra-sonic Waves, *C.R.*, vol. 194, pp. 2132-2134, 1932; more fully in *J. phq.*, vol. 3, pp. 464-477, 1932.
322. LÜDY, W.: The Piezoelectricity of Potassium Phosphate, *ZS. Ph.*, vol. 113, pp. 302-305, 1939; *Helv. Ph. Ac.*, vol. 12, pp. 278-279, 1939.
323. LÜDY, W.: Effect of Temperature on the Dynamic-elastic Behavior of Substances like Rochelle Salt, *Helv. Ph. Ac.*, vol. 15, pp. 527-552, 1942.
324. MACKINNON, K. A.: Crystal Control Applied to the Dynatron Oscillator, *Proc. I.R.E.*, vol. 20, pp. 1689-1714, 1932.
325. MALLETT, E., and V. J. TERRY: The Quartz Oscillator, *W. World*, vol. 16, pp. 630-636, 1925.
326. MANDELL, W.: The Determination of the Elastic Moduli of the Piezoelectric Crystal Rochelle Salt by a Statical Method, *Proc. Roy. Soc.*, vol. 116, pp. 623-636, 1927.
327. MANDELL, W.: The Change in Elastic Properties on Replacing the Potassium Atom of Rochelle Salt by the Ammonium Group, *Proc. Roy. Soc.*, vol. 121, pp. 122-130, 1928.
328. MANDELL, W.: The Determination of the Piezoelectric Moduli of Ammonium Seignette Salt, *Proc. Roy. Soc.*, vol. 121, pp. 130-140, 1928.
329. MANDELL, W.: Resonance in Crystal Beams of Sodium-ammonium Seignette Salt, *Proc. Roy. Soc.*, vol. 165, pp. 414-431, 1938.
330. MARRISON, W. A.: A High Precision Standard of Frequency, *Proc. I.R.E.*, vol. 17, pp. 1103-1122, 1929; *Bell Syst. T.J.*, vol. 8, pp. 493-514, 1929.
331. MARRISON, W. A.: The Crystal Clock, *Proc. Nat. Acad. Sci.*, vol. 16, pp. 496-507, 1930.
332. MASON, W. P.: Electrical Wave Filters Employing Quartz Crystals as Elements, *Bell Syst. T.J.*, vol. 13, pp. 405-452, 1934.
333. MASON, W. P.: The Motion of a Bar Vibrating in Flexure, Including the Effects of Rotary and Lateral Inertia, *J.A.S.A.*, vol. 6, pp. 246-249, 1935.
334. MASON, W. P.: An Electromechanical Representation of a Piezoelectric Crystal Used as a Transducer, *Proc. I.R.E.*, vol. 23, pp. 1252-1263, 1935; *Bell. Syst. T.J.*, vol. 14, pp. 718-723, 1935.
335. MASON, W. P.: A Dynamic Measurement of the Elastic, Electric and Piezoelectric Constants of Rochelle Salt, *Phys. Rev.*, vol. 55, pp. 775-789, 1939.
336. MASON, W. P.: A New Quartz-crystal Plate, Designated the GT, Which Produces a Very Constant Frequency over a Wide Temperature Range, *Proc. I.R.E.*, vol. 28, pp. 220-223, May, 1940.
337. MASON, W. P.: Low Temperature Coefficient Quartz Crystals, *Bell Syst. T.J.*, vol. 19, pp. 74-93, 1940.
338. MASON, W. P.: The Location of Hysteresis Phenomena in Rochelle Salt Crystals, *Phys. Rev.*, vol. 58, pp. 744-756, 1940.
339. MASON, W. P.: Electrical and Mechanical Analogies, *Bell Syst. T.J.*, vol. 20, pp. 405-414, 1941.

340. MASON, W. P.: Quartz Crystal Applications, *Bell Syst. T.J.*, vol. 22, pp. 178-223, 1943.
341. MASON, W. P., and I. E. FAIR: A New Direct Crystal-controlled Oscillator for Ultra-short-wave Frequencies, *Proc. I.R.E.*, vol. 30, pp. 464-472, 1942.
342. MASON, W. P., and R. A. SYKES: Electrical Wave Filters Employing Crystals with Normal and Divided Electrodes, *Bell Syst. T.J.*, vol. 19, pp. 221-248, 1940.
343. MASON, W. P., and R. A. SYKES: Low Frequency Quartz-crystal Cuts Having Low Temperature Coefficients, *Proc. I.R.E.*, vol. 32, pp. 208-215, 1944.
344. MATSUMURA, S., and K. HATAKEYAMA: Comparison between Oscillations of Short Wave Length Produced by Means of Quartz Resonator with Reference to the Effect of the Air Gap, *J.I.T.T.E. Jap.*, no. 87, pp. 575-580, 1930.
345. MATSUMURA, S., and K. HATAKEYAMA: On a Discontinuity in Wave Length of an X-cut Quartz Resonator Depending on the Dimensional Relation, *J.I.T.T.E. Jap.*, no. 91, pp. 946-952, October, 1930.
346. MATSUMURA, S., and K. HATAKEYAMA: On a Discontinuity in Wave Length of an X-cut Quartz Resonator of Rectangular Form and Method of Determining the Most Suitable Dimensions, *J.I.T.T.E. Jap.*, no. 97, pp. 469-477, April, 1931.
347. MATSUMURA, S., and K. HATAKEYAMA: Relation between the Wave Length Constant and Dimension of Rectangular X-cut Quartz Resonators, *J.I.T.T.E. Jap.*, no. 101, pp. 984-989, August, 1931.
348. MATSUMURA, S., and S. ISHIKAWA: On Tourmaline Oscillators, *R.R.R.W. Jap.*, vol. 3, pp. 1-5, 1933.
349. MATSUMURA, S., S. ISHIKAWA, and S. KANZAKI: Effect of Temperature on Piezoelectric Vibration of Tourmaline Plate, *J.I.E.E. (Japan)*, vol. 53, p. 199, 1933; *Monthly Bibliographical. Ref. U.R.S.I.*, p. 10, May, 1933.
350. MATSUMURA, S., and S. KANZAKI: On the Temperature Coefficient of Natural Frequency of Y-waves in X-cut Quartz Plates, *R.R.R.W. Jap.*, vol. 2, pp. 35-48, 157-173, 1932.
351. MATSUMURA, S., and S. KANZAKI: On a Method of Reducing the Temperature Coefficient of a Piezo-resonator, *J.I.T.T.E. Jap.*, no. 111, pp. 834-842, 1932; *J.I.E.E. (Japan)*, vol. 52, suppl. issue, pp. 172-174, 929, 1932.
352. MATSUMURA, S., and S. KANZAKI: Quartz Plates with a Very Small Temperature-coefficient of Oscillation Frequency, *U.R.S.I. Gen. Assembly, Document 34, Comm. I*, London, 1934; *Elec. Rev. (Jap.)*, vol. 21, pp. 24f., 1933; *R.R.R.W. Jap.*, vol. 4, pp. 105-108, 1934; abstr. in *J.I.E.E. (Japan)*, vol. 52, p. 932, 1932, vol. 53, p. 201, 1933.
353. MATTHIAS, B.: On the Piezoelectric ΔE -effect in the Seignette-electrics, *Helv. Ph. Ac.*, vol. 16, pp. 99-135, 1943.
354. MATTHIAS, B., and P. SCHERRER: Crystal Band Pass Filters, *Helv. Ph. Ac.*, vol. 16, pp. 432-434, 1943.
355. MATTIAT, O.: On Vibrating Crystals of Rochelle Salt, *Hfr. u. El. ak.*, vol. 50, pp. 115-120, 1937.
356. McSKIMIN, H. J.: Theoretical Analysis of Modes of Vibration for Isotropic Rectangular Plates Having All Surfaces Free, *Bell Syst. T.J.*, vol. 23, pp. 151-177, 1944.
357. MEACHAM, L. A.: The Bridge-stabilized Oscillator, *Proc. I.R.E.*, vol. 26, pp. 1278-1294, 1938; *Bell Syst. T.J.*, vol. 17, pp. 574-591, 1938; short account in *Bell Labs. Rec.*, suppl. to vol. 18, January, 1940.
358. MEAHL, H. R.: Quartz Crystal Controlled Oscillator Circuits, *Proc. I.R.E.*, vol. 22, pp. 732-737, 1934.
359. MEISSNER, A.: Piezoelectric Crystals at High Frequency, *ZS. tech. Ph.*, vol. 7,

- pp. 585-592, 1926, vol. 8, pp. 74-77, 1927; *ENT*, vol. 3, pp. 401-408, 1926; *ZS. Hfr.*, vol. 29, pp. 20-24, 1927.
360. MEISSNER, A.: Piezoelectric Crystals at Radio Frequencies, *Proc. I.R.E.*, vol. 15, pp. 281-296, 1927.
361. MEISSNER, A.: Investigations on Quartz, *Phys. ZS.*, vol. 28, pp. 621-625, 1927.
362. MEISSNER, A., and R. BECHMANN: Investigation and Theory of Pyroelectricity, *ZS. tech. Ph.*, vol. 9, pp. 175-186, 1928.
363. MELIKIAN, A. B., and E. K. PIETROVA: On a Method for the Determination of Parameters of Piezo-resonators, *Izv. El. Slab. Toka*, no. 3, pp. 40-51, 1935.
364. MENDELSSOHN, J., and K. MENDELSSOHN: Specific Heat of a Substance Showing Spontaneous Electric Polarization, *Nature*, vol. 144, p. 595, 1939.
365. METSCHL, E. C.: The Nature and Applications of Piezoelectricity, *ETZ*, vol. 59, pp. 819-825, 1938.
366. MIKHAILOV, G.: The Influence of Temperature on the Frequency of Piezoelectric Oscillations in Rochelle Salt, *Tech. Phys. U.S.S.R.*, vol. 3, pp. 511-518, 1936.
367. MIKHAILOV, G.: The Investigations of Elastic Vibration in a Piezocrystal of Rochelle Salt, *Tech. Phys. U.S.S.R.*, vol. 3, pp. 652-661, 1936.
368. MIKHAILOV, G.: Influence of Temperature on the Dynamic Piezo-modulus of Rochelle Salt, *Tech. Phys. U.S.S.R.*, vol. 4, pp. 461-465, 1937.
369. MILLER, J. M.: Quartz Crystal Oscillators, *U.S. Navy Radio Sound Rept.*, issue of Apr. 1, May 1, June 1, 1925, pp. 53-64.
370. MITSUI, H.: Broadcast Frequency Monitor Employing Luminous Quartz Resonator, *Nippon Elec. Comm. Eng.*, no. 1, pp. 86-87, September, 1935.
371. MODRAK, P.: Quartz and Tourmaline, *W.E.*, vol. 14, pp. 127-134 and 175-183, 1937.
372. MOENS, R., and J. E. VERSCHAFFELT: Optical Phenomena Exhibited by Quartz When Vibrating Piezoelectrically, *C.R.*, vol. 185, pp. 1034-1036, 1927.
373. MÖGEL, H.: Control of Operation of Short-wave Transmitters, *ENT*, vol. 7, pp. 333-348, 1930; *Telef.-Z.*, vol. 11, pp. 8-21, 1930.
374. MÖGEL, H.: Monitoring the Operation of Short-wave Transmitters, *Proc. I.R.E.*, vol. 19, pp. 214-232, 1931.
375. MORRISON, J. F.: A New Broadcast Transmitter Circuit Design for Frequency Modulation, *Proc. I.R.E.*, vol. 28, pp. 444-449, 1940.
376. MUELLER, H.: Properties of Rochelle Salt, *Phys. Rev.*, vol. 47, pp. 175-191, 1935.
377. MUELLER, H.: Determination of Elasto-optical Constants with Supersonic Waves, *ZS. Kr.*, vol. 99, pp. 122-141, 1938.
378. MUELLER, H.: Properties of Rochelle Salt, II, *Phys. Rev.*, vol. 57, pp. 829-839, 1940.
379. MUELLER, H.: Influence of Electrostatic Fields on the Elastic Properties of Rochelle Salt, *Phys. Rev.*, vol. 57, pp. 842-843, 1940.
380. MUELLER, H.: Properties of Rochelle Salt, III, *Phys. Rev.*, vol. 58, pp. 565-573, 1940.
381. MUELLER, H.: Properties of Rochelle Salt, IV, *Phys. Rev.*, vol. 58, pp. 805-811, 1940.
382. MUELLER, H.: The Dielectric Anomalies of Rochelle Salt, *Ann. N.Y. Acad. Sci.*, vol. 40, pp. 321-356, 1940.
383. MÜLLER, H., and T. KRAEFFT: Doppler Effect with Piezoelectric Quartz, *Phys. ZS.*, vol. 33, pp. 305-306, 1932.
384. MURPHY, E. J., and S. O. MORGAN: The Dielectric Properties of Insulating Materials, *Bell Syst. T.J.*, vol. 16, pp. 493-512, 1937, vol. 17, pp. 640-669, 1938.

385. MYERS, L. M.: Application of the Electrometer Triode to the Determination of Piezoelectric Constants, *Brit. Rad. Ann.*, pp. 15-20, 1934-5.
386. NACHTIKAL, F.: Proportionality between Piezoelectric Moment and Pressure, *Nachr. Gött.*, pp. 109-118, 1899.
387. NACKEN, R.: Etching Experiments with Spheres of Quartz and α -quartz, *Neues Jahrb. Min.*, vol. 1, pp. 71-82, 1916.
388. NAMBA, S., and S. MATSUMURA: Piezoelectric Properties of Quartz and Its Value as a Frequency Standard, *J.I.T.T.E. Jap.*, no. 70, pp. 817-833, November, 1928; *Researches Electrotech. Lab. (Tokyo)*, no. 248, April, 1929 (in English); also in abbreviated form in *ZS. Hfr.*, vol. 34, pp. 198-200, 1929.
389. NAMBA, S., and S. MATSUMURA: Piezoelectric Quartz Resonator with a Small Temperature Coefficient, *J.I.E.E. (Japan)*, vol. 49, suppl. issue, pp. 9-10, 1929.
390. NELSON, E. L.: Radio Broadcasting Transmitters and Related Transmission Phenomena, *Bell Syst. T.J.*, vol. 9, pp. 121-140, 1930.
391. NICOLSON, A. M.: The Piezoelectric Effect in the Composite Rochelle Salt Crystal, *Trans. A.I.E.E.*, vol. 38, pp. 1467-1485, 1919; *Proc. A.I.E.E.*, vol. 38, pp. 1315-1333, 1919; *Electrician (London)*, vol. 83, pp. 32f., 1919.
392. NIESSEN, K. F.: Frequency-stability of Some Resonators, *Physica*, vol. 8, pp. 1077-1093, 1941.
393. NORGORDEN, O.: The Inverse Piezoelectric Properties of Rochelle Salt at Audio Frequencies, *Phys. Rev.*, vol. 49, pp. 820-828, 1936.
394. NORGORDEN, O.: The Piezoelectric Properties of Rochelle Salt, *Phys. Rev.*, vol. 50, p. 782, 1936 (letter to the editor).
395. NUSSBAUMER, B.: Measurement of the First Piezoelectric Modulus of Quartz, *ZS. Ph.*, vol. 78, pp. 781-790, 1932.
- NY TSI-ZE—see TSI-ZE.
396. ONNES, H. K., and A. BECKMAN: Piezoelectric and Pyroelectric Properties of Quartz at Low Temperatures, *Konink. Akad. Amst.*, vol. 15, pp. 1380-1383, 1913; *Communication 132f Phys. Lab. Leyden*.
397. OPLATKA, G.: A New Method of Determining the Static Dielectric Constants of Semiconductors, and Measurements of the Dielectric Constant of Rochelle Salt, *Phys. ZS.*, vol. 34, pp. 296-300, 1933.
398. OSTERBERG, H.: An Interferometer Method of Observing the Vibrations of an Oscillating Quartz Plate, *Proc. Nat. Acad. Sci.*, vol. 15, pp. 892-896, 1929.
399. OSTERBERG, H.: An Interferometer Method of Studying the Vibrations of an Oscillating Quartz Plate, *J.O.S.A.*, vol. 22, pp. 19-35, 1932.
400. OSTERBERG, H.: A Triple Interferometer for Distinguishing Flexural and Longitudinal Vibrations in Quartz, *J.O.S.A.*, vol. 23, pp. 30-34, 1933.
401. OSTERBERG, H.: A Multiple Interferometer for Analyzing the Vibrations of a Quartz Plate, *Phys. Rev.*, vol. 43, pp. 819-829, 1933.
402. OSTERBERG, H.: A Refracting Interferometer for Examining Modes of Vibration in Quartz Plates, *R.S.I.*, vol. 5, pp. 183-186, 1934.
403. OSTERBERG, H., and J. W. COOKSON: Piezoelectric Stabilization of High Frequencies, *R.S.I.*, vol. 5, pp. 281-286, 1934.
404. OSTERBERG, H., and J. W. COOKSON: Some Piezoelectric and Elastic Properties of β -quartz, *J. Frank. Inst.*, vol. 220, pp. 361-371, 1935.
405. OSTERBERG, H., and J. W. COOKSON: A Theory of Two-dimensional Longitudinal and Flexural Vibrations in Rectangular Isotropic Plates, *Physics*, vol. 6, pp. 234-246, 1935.
406. OSTERBERG, H., and J. W. COOKSON: Longitudinal, Shear and Transverse Modes of Vibration in Quartz and Tourmaline, *Physics*, vol. 6, pp. 246-256, 1935.

407. OSTERBERG, H., and J. W. COOKSON: An Interference Method for Measuring the Piezoelectric Moduli of Alpha-quartz: The Moduli, *R.S.I.*, vol. 6, pp. 347-356, 1935.
408. PAVLIK, B.: Two Transmitting Circuits with Octode, *ENT*, vol. 12, pp. 53-54, 1935.
409. PAVLIK, B.: Contribution to the Theoretical and Experimental Investigation of Flexural Vibrations in Rectangular Plates with Free Edges, *An. Phk.*, vol. 27, pp. 532-542, 1936.
410. PAVLIK, B.: Contribution to the Investigation of Flexural Vibrations of Plates in the Form of Parallelograms with Free Edges, *An. Phk.*, vol. 28, pp. 353-360, 1937.
411. PAVLIK, B.: The Possibility of Exciting Simple Modes of Vibration in Piezoelectric Crystals of Low Symmetry, *ZS. Kr.*, vol. 100, pp. 414-419, 1938.
412. PERRIER, A.: Hypotheses Concerning Spontaneous Dielectric Polarization, and Some Experimental Results, *Arch. sci. phys. nat.*, vol. 41, pp. 492f., 1916.
413. PERRIER, A., and R. DE MANDROT: Elasticity and Symmetry of Quartz at High Temperatures, *Mém. société vaudoise sci. nat.*, vol. 1, pp. 333-363, 1922-1924; *C.R.*, vol. 175, pp. 622-624, 1006, 1922; abst. in *Arch. sci. phys. nat.*, vol. 4, pp. 367-369, 1922.
414. PETRZILKA, V.: On the Relation between the Optical and Piezoelectric Properties of Vibrating Quartz Crystals, *An. Phk.*, vol. 11, pp. 623-632, 1931.
415. PETRZILKA, V.: Tourmaline Resonators for Short and Ultra-short Waves, *An. Phk.*, vol. 15, pp. 72-88, 1932.
416. PETRZILKA, V.: Longitudinal and Flexural Vibrations of Tourmaline Plates, *An. Phk.*, vol. 15, pp. 881-902, 1932.
417. PETRZILKA, V.: Longitudinal Oscillations of Circular Quartz Plates, *An. Phk.*, vol. 23, pp. 156-168, 1935.
418. PETRZILKA, V.: Longitudinal Vibrations of Rectangular Quartz Plates, *ZS. Ph.*, vol. 97, pp. 436-454, 1935.
419. PETRZILKA, V.: Control of Transmitters by Lengthwise Vibrations of Tourmaline Plates, *Hfr. u. El. ak.*, vol. 50, pp. 1-5, 1937.
420. PETRZILKA, V., and W. FEHR: On Steady-state Oscillating Conditions in Quartz-controlled Single and Two-circuit Transmitters, *ENT*, vol. 9, pp. 283-292, 1932.
421. PETRZILKA, V., and L. ZACHOVAL: Direct Observation of Oscillations of a Quartz Plate by Means of the Schlieren Method, *ZS. Ph.*, vol. 90, pp. 700-702, 1934.
422. PIELEMEIER, W. H.: Acoustical Detection of Electrically Weak Vibrations in Quartz Plates, *J.A.S.A.*, vol. 9, pp. 212-216, 1938.
423. PIERCE, G. W.: Piezoelectric Crystal Resonators and Crystal Oscillators Applied to the Precision Calibration of Wavemeters, *Proc. A.A.A.S.*, vol. 59, pp. 81-106, 1923.
424. PIERCE, G. W.: Piezoelectric Crystal Oscillators Applied to the Precision Measurement of the Velocity of Sound in Air and Carbon Dioxide at High Frequencies, *Proc. A.A.A.S.*, vol. 60, pp. 277-302, 1925.
425. PINCIROLI, A.: On a New Piezoelectric Oscillator, *Alta freq.*, vol. 11, pp. 341-343, 1942.
426. PITT, A., and D. W. R. MCKINLEY: Variation with Temperature of the Piezoelectric Effect in Quartz, *Can. J. Res.*, A, vol. 14, pp. 57-65, 1936.
427. POCKELS, F.: On the Changes in Optical Behavior and Elastic Deformations of Dielectric Crystals in an Electric Field, *Neues Jahrb. Min.*, vol. 7 (supplementary vol.), pp. 201-231, 1890.
428. POCKELS, F.: On the Effect of an Electrostatic Field on the Optical Behavior

- of Piezoelectric Crystals, *Abh. Gött.*, vol. 39, pp. 1-204, 1894 (also in book form^{B40}).
429. PONTECORVO, P.: Piezo-oscillators of High Frequency Stability Obtained by the Simultaneous Use of Positive and Negative Feedback, *Alta freq.*, vol. 7, pp. 365-381, 1938.
430. POPPEL, J. R., F. W. CUNNINGHAM, and A. W. KISHPAUGH: Design and Equipment of a Fifty-kilowatt Broadcast Station for WOR, *Proc. I.R.E.*, vol. 24, pp. 1063-1081, 1936.
431. POWERS, W. F.: Temperature Coefficient of Frequency of Quartz Resonators (abst.), *Phys. Rev.*, vol. 23, p. 783, 1924.
432. QUERVAIN, M. DE, and B. ZWICKER: Observations of the Elementary Electric Domains in the Seignette-electrics, *Helv. Ph. Ac.*, vol. 16, pp. 216-218, 1943.
433. RAYNER, E. H.: The Researches of the Late Dr. D. W. Dye on the Vibrations of Quartz, *J.I.E.E. (London)*, vol. 72, pp. 519-527, 1933; *Proc. Wireless Sec., I.E.E.*, vol. 8, pp. 99-107, 1933.
434. RIECKE, E.: Molecular Theory of the Piezoelectricity of Tourmaline, *Phys. ZS.*, vol. 13, pp. 409-415, 1912; *Nachr. Gött.*, pp. 253-266, 1912.
435. RIECKE, E., and W. VOIGT: Piezoelectric Constants of Quartz and Tourmaline, *Nachr. Gött.*, pp. 247-255, 1891; *Wied. An.*, vol. 45, pp. 523-552, 1892.
436. ROHDE, L.: New Types of Quartz Master-oscillators and Filters, *ZS. tech. Phys.*, vol. 20, pp. 75-80, 1939.
437. ROHDE, L.: Audio-frequency Quartz Oscillators and Filters, *ZS. tech. Phys.*, vol. 21, pp. 30-34, 1940.
438. ROHDE, L., and H. HANDREK: The Properties of Quartz Resonators at Audio- and Intermediate Frequencies, *ZS. tech. Phys.*, vol. 21, pp. 401-405, 1940.
439. RÖNTGEN, W. C.: Pyro- and Piezoelectric Investigations, *An. Phk.*, vol. 45, pp. 737-800, 1914.
440. RÖNTGEN, W. C., and A. JOFFÉ: On the Electric Conductivity of Certain Crystals and the Effect of Radiation Thereupon, *An. Phk.*, vol. 41, pp. 449-498, 1913.
441. RUSTERHOLZ, A. A.: Anomaly in the Specific Heat of Rochelle Salt, *Helv. Ph. Ac.*, vol. 7, pp. 643-644, 1934, vol. 8, pp. 39-54, 1935.
442. RZIAKIN, A. G.: Attenuation of Oscillations in Piezoelectric Quartz Crystals, *J. Tech. Phys.*, vol. 4, pp. 1282-1294, 1934.
443. SABAROFF, S.: A Voltage Stabilized High-frequency Crystal Oscillator Circuit, *Proc. I.R.E.*, vol. 25, pp. 623-629, 1937.
444. SABBATINI, A.: Multiple Oscillations of Piezoelectric Crystals and Their Dependence upon Circuit Conditions, *Dati e mem.*, vol. 2, pp. 618-636, 1930.
445. SALISBURY, W. W., and C. W. PORTER: An Efficient Piezoelectric Oscillator, *R.S.I.*, vol. 10, pp. 269-270, 1939.
446. SANDERS, E. W.: Modes of Fracture in Piezoelectric Crystals, *QST*, vol. 21, pp. 17-18, 84, 1937.
447. SANDERS, E. W.: Wave Propagation in Shearing Quartz Oscillators of High Frequency, *J. Appl. Ph.*, vol. 11, pp. 299-300, 1940.
448. SAWYER, C. B.: The Use of Rochelle Salt Crystals for Electrical Reproducers and Microphones, *Proc. I.R.E.*, vol. 19, pp. 2020-2029, 1931.
449. SAWYER, C. B., and C. H. TOWER: Rochelle Salt as a Dielectric, *Phys. Rev.*, vol. 35, pp. 269-273, 1930.
450. SCHAAFFS, W.: A Schlieren Test of the Vibrations of a Thin Quartz Plate, *ZS. Ph.*, vol. 105, pp. 576-578, 1937.
451. SCHERRER, P.: Investigations of the Dielectric Behavior of Rochelle Salt and Related Materials, *ZS. Elektrochem.*, vol. 45, pp. 171-174, 1939.

452. SCHIFFERMÜLLER, R.: On the Multiplicity of Vibrations in Thin Piezoelectric Quartz Plates, *ZS. tech. Ph.*, vol. 19, pp. 469-475, 1938.
 SCHUBNIKOW—see SHUBNIKOV
 SCHULWAS—see SHULVAS.
453. SCHUMACHER, R. O.: Investigations on Transversally Vibrating Quartz Plates, *Telef.-Z.*, vol. 18, pp. 16-21, 1937.
454. SCHWARTZ, E.: Experimental Investigations of the Piezoelectric and Dielectric Properties of Rochelle Salt, *ENT*, vol. 9, pp. 481-495, 1932.
455. SEIDL, F.: An Interesting Crack in Piezoelectric Quartz, *Naturwiss.*, vol. 17, pp. 781-782, 1929.
456. SEIDL, F.: Conductivity of Loaded Piezoelectric Quartz, *ZS. Ph.*, vol. 75, pp. 488-503, 1932.
457. SEIDL, F.: Action of Radium and X-rays on Piezoelectric Quartz, *Ber. Wien*, vol. 142, pp. 467-469, 1933.
458. SEIDL, F.: The Electrical Behavior of Rochelle Salt Single Crystals Produced from a Saturated Solution in an Electric Field, *Anz. Wien*, no. 11, pp. 92-93, 1936.
459. SEIDL, F.: The Anomalous Charging Current in Rochelle Salt Crystals, *Phys. ZS.*, vol. 39, pp. 714-716, 1938.
460. SEIDL, F., and E. HUBER: Effect of X-rays and Gamma-rays on Piezoelectric Crystals, *ZS. Ph.*, vol. 97, pp. 671-680, 1935.
461. SHAW, H. S.: Oscillating Crystals, *QST*, vol. 7, pp. 30f., July, 1924.
462. SHORE, S. X.: A series of articles on the grading and orientation of quartz crystals and the sawing, lapping, finishing, and testing of quartz plates, *Communications*, vol. 23, October-December, 1943, vol. 24, January, February, 1944.
463. SHUBNIKOV, A.: On Impact-patterns on Quartz, *ZS. Kr.*, vol. 74, pp. 103-104, 1930.
464. SHULVAS-SOROKINA, R. D.: Is It Possible to Determine the Piezoelectric Constant at High Temperature by the Statical Method? *Phys. Rev.*, vol. 34, pp. 1448-1450, 1929.
465. SHULVAS-SOROKINA, R. D.: Piezoelectric Properties of Rochelle Salt Crystals, *ZS. Ph.*, vol. 73, pp. 700-706, 1932.
466. SHULVAS-SOROKINA, R. D.: On a Characteristic Temperature in Rochelle Salt Crystals, *ZS. Ph.*, vol. 77, pp. 541-546, 1932.
467. SHULVAS-SOROKINA, R. D.: Relaxation Time in Rochelle Salt Crystals, II, *J. Exp. Th. Ph. U.S.S.R.*, vol. 7, pp. 1440-1447, 1937; *Phys. ZS. d. Sovjetunion*, vol. 12, pp. 685-700, 1937.
468. SHULVAS-SOROKINA, R. D.: Polarization of Rochelle Salt Crystals at Low Voltages, *J. Tech. Phys.*, vol. 11, pp. 947-958, 1941.
469. SHULVAS-SOROKINA, R. D., and M. V. POSNOV: The Time of Relaxation in Crystals of Rochelle Salt, *Phys. Rev.*, vol. 47, pp. 166-174, 1935.
470. SKELLETT, A. M.: A Visual Method for Studying Modes of Vibration of Quartz Plates, *J.O.S.A.*, vol. 17, pp. 308-317, 1928.
471. SKELLETT, A. M.: Modes of Vibration of a Round Plate Cut from a Quartz Crystal, *J.O.S.A.*, vol. 20, pp. 293-302, 1930.
472. SMIRNOV, V. A.: The Effect of the Parameters of a Piezoelectric Quartz Oscillator on Its Operation, and the Maximum Permissible Power Rating for Such an Oscillator, *J. Tech. Phys.*, vol. 6, pp. 493-513, 1936.
473. SOKOLOV, S. J.: Oscillations of Piezoelectric Quartz Rods in Non-uniform Fields, *ZS. Ph.*, vol. 50, pp. 385-394, 1928.
474. SPEIGHT, J. W.: The Electrodynamic Characteristics of the Quartz Piezoelectric Oscillator, *Can. J. Res.*, vol. 12, pp. 812-819, 1935.

475. STAMFORD, N. C.: The Production of Rochelle Salt Piezoelectric Resonators Having a Pure Longitudinal Mode of Vibration, *Proc. I.R.E.*, vol. 25, pp. 465-471, 1937.
476. STARR, A. T.: Electro-acoustic Reactions, *W. E.*, vol. 17, pp. 247-256, 303-309, 1940.
477. STAUB, H.: Investigation of the Dielectric Properties of Rochelle Salt by Means of X-rays, *Helv. Ph. Ac.*, vol. 7, pp. 3-45, 1934; *Phys. ZS.*, vol. 34, pp. 292-296, 1933; thesis, 1934.
478. STAUB, H.: Evidence for the Internal Electric Field of Rochelle Salt by Means of X-rays, *Helv. Ph. Ac.*, vol. 7, pp. 480-482, 1934; *Phys. ZS.*, vol. 35, pp. 720-725, 1934.
479. STAUB, H.: Dielectric Anomalies of Rochelle Salt, *Naturwiss.*, vol. 23, pp. 728-733, 1935.
480. STEPHENSON, C. C., and H. E. ADAMS: The Heat Capacity of Ammonium Dihydrogen Arsenate from 15 to 300°K. The Anomaly at the Curie Temperature, *J. Am. Chem. Soc.*, vol. 66, pp. 1409-1412, 1944.
481. STEPHENSON, C. C., and J. G. HOOLEY: The Heat Capacity of Potassium Dihydrogen Phosphate from 15 to 300°K. The Anomaly at the Curie Temperature, *J. Am. Chem. Soc.*, vol. 66, pp. 1397-1401, 1944.
482. STEPHENSON, C. C., and A. C. ZETTLEMOYER: The Heat Capacity of Potassium Dihydrogen Arsenate from 15 to 300°K. The Anomaly at the Curie Temperature, *J. Am. Chem. Soc.*, vol. 66, pp. 1402-1405, 1944.
483. STEPHENSON, C. C., and A. C. ZETTLEMOYER: The Heat Capacity of Ammonium Dihydrogen Phosphate from 15 to 300°K. The Anomaly at the Curie Temperature, *J. Am. Chem. Soc.*, vol. 66, pp. 1405-1408, 1944.
484. STRAUBEL, H.: Piezoelectric Quartz Oscillators, *Phys. ZS.*, vol. 32, p. 222, 1931.
485. STRAUBEL, H.: Some Experiments in Supersonics, *Phys. ZS.*, vol. 32, pp. 379-381, 1931.
486. STRAUBEL, H.: Piezoelectric Oscillators, *Phys. ZS.*, vol. 32, pp. 586-587, 1931.
487. STRAUBEL, H.: Direct Crystal Control for Ultra-short Waves, *Phys. ZS.*, vol. 32, pp. 937-941, 1931.
488. STRAUBEL, H.: Oscillation Form and Temperature Coefficient of Quartz Oscillators, *ZS. Hfr.*, vol. 38, pp. 14-27, 1931.
489. STRAUBEL, H.: Crystal Control of Ultra-short Wave Transmitters, *V.D.I.*, vol. 76, pp. 873-874, 1932.
490. STRAUBEL, H.: Modes of Vibration of Piezoelectric Crystals, *Phys. ZS.*, vol. 34, pp. 894-896, 1933.
491. STRAUBEL, H.: Temperature Coefficient, Mode of Vibration, and Amplitude of Piezoelectric Oscillators, *Phys. ZS.*, vol. 35, pp. 179-181, 1934.
492. STRAUBEL, H.: The Temperature Coefficient of Quartz Oscillators, *Phys. ZS.*, vol. 35, pp. 657-658, 1934.
493. STRAUBEL, H.: The Temperature Coefficient of Quartz Oscillators, *ZS. tech. Ph.*, vol. 15, pp. 607-608, 1934.
494. STRAUBEL, H.: Crystal Control of Decimeter Waves, *ZS. tech. Ph.*, vol. 16, pp. 627-629, 1935.
495. STRAUBEL, H.: Crystal Control of Ultra-short Waves, *Hfr. u. El. ak.*, vol. 46, pp. 4-6, 1935.
496. STRAUBEL, H.: Crystal Control of Decimeter Waves, *Hfr. u. El. ak.*, vol. 47, pp. 152-154, 1936.
497. STRONG, J. A.: New Method of Investigating the Modes of Vibration of Quartz Crystals, *Nature*, vol. 129, p. 59, 1932.

498. SYKES, R. A.: Modes of Motion in Quartz Crystals, the Effects of Coupling and Methods of Design, *Bell Syst. T.J.*, vol. 23, pp. 52-96, 1944.
499. SYKES, R. A.: Principles of Mounting Quartz Plates, *Bell Syst. T.J.*, vol. 23, pp. 178-189, 1944.
500. SZÉKELY, A.: A Simple Method for Determining the First Piezoelectric Modulus of Quartz from Measurements on a Quartz Resonator, *ZS. Ph.*, vol. 78, pp. 560-566, 1932.
501. TAKAGI, N., and Y. MIYAKE: Thickness Vibrations of a Rochelle Salt Plate, *Electrotech. Jour. (Jap.)*, vol. 4, p. 120, 1940.
502. TAKAGI, N., and H. NAKASE: New Characteristics of Pentode Quartz Oscillator, *Electrotech. Jour. (Jap.)*, vol. 2, pp. 22-23, 1938.
503. TAMARU, T.: Determination of the Piezoelectric Constants of Tartaric Acid Crystals, *Phys. ZS.*, vol. 6, p. 379, 1905.
504. TASCHEK, R., and H. OSTERBERG: Crystalline Symmetry and Shear Constants of Rochelle Salt, *Phys. Rev.*, vol. 50, p. 572, 1936.
505. TAWIL, E. P.: On the Variations of the Optical Properties of Piezoelectric Quartz under the Action of High-frequency Electric Fields, *C.R.*, vol. 183, pp. 1099-1101, 1926.
506. TAWIL, E. P.: Observations on Piezoelectric Quartz at Resonance, *C.R.*, vol. 185, pp. 114-116, 1927.
507. TAWIL, E. P.: The Vibrations of Piezoelectric Quartz Made Visible by Polarised Light, *Bull. soc. min. fr.*, p. 129S, Nov. 16, 1928.
508. TAWIL, E. P.: New Method for the Development of Electricity by the Torsion of Quartz Crystals, *C.R.*, vol. 187, pp. 1042-1044, 1928.
509. TAWIL, E. P.: The Vibrations of Piezoelectric Quartz Made Visible by Polarized Light, *Rev. gén. de l'élec.*, vol. 25, p. 58, 1929.
510. TAWIL, E. P.: On the Vibrations along the Optical Axis in an Oscillating Piezoelectric Quartz Crystal, *C.R.*, vol. 189, pp. 163-164, 1929.
511. TAWIL, E. P.: Stationary Ultrasonic Waves Made Visible in Gases by the Method of Striations, *C.R.*, vol. 191, pp. 92-95, 1930.
512. TAWIL, E. P.: Liberation of Electricity in Quartz Crystals by Flexure, *C.R.*, vol. 192, pp. 274-277, 1931.
513. TAWIL, E. P.: Laws of the Liberation of Electricity by Torsion in Quartz, *C.R.*, vol. 199, pp. 1025-1026, 1934.
514. TAWIL, E. P.: Remarks on the Liberation of Electricity by Torsion in Quartz, *C.R.*, vol. 200, pp. 1088-1090, 1935.
515. TAWIL, E. P.: Remarks on the Liberation of Electricity by Torsion in Quartz and on the Reciprocal Phenomenon, *C.R.*, vol. 200, pp. 1306-1308, 1935.
516. TAWIL, E. P.: On a Piezoelectric Chronograph *C.R.*, vol. 202, pp. 1016-1018, 1936.
517. TERRY, E. M.: The Dependence of the Frequency of Quartz Piezoelectric Oscillators upon Circuit Constants, *Proc. I.R.E.*, vol. 16, pp. 1486-1506, 1928.
518. THOMSON, W. T.: Effect of Rotary and Lateral Inertia on Flexural Vibration of Prismatic Bars, *J.A.S.A.*, vol. 11, pp. 198-204, 1939.
519. THURSTON, G. M.: Flatness and Parallelism in Quartz Plates, *Bell Labs. Rec.*, vol. 22, pp. 435-439, 1944.
520. THURSTON, G. M.: A Crystal Test Set, *Bell Labs. Rec.*, vol. 22, pp. 477-480, 1944.
521. TOLANSKY, S.: Topography of a Quartz Crystal Face, *Nature*, vol. 153, pp. 195-196, 1944.
522. TOURNIER, M.: History and Applications of Piezoelectricity, *Elec. Comm.*, vol. 15, pp. 312-327, 1937; *ENT*, vol. 15, pp. 320-334, 1937.

523. TSI-ZE, NY: Electric Deformations of Quartz, *C.R.*, vol. 184, pp. 1645-1647, 1927.
524. TSI-ZE, NY: Experimental Study of the Deformations and of the Changes in the Optical Properties of Quartz under the Influence of an Electric Field, *J. phq.*, vol. 9, pp. 13-37, 1928; *C.R.*, vol. 185, pp. 195-197, 1927.
525. TSI-ZE, NY: The Transverse Circular Vibration of a Hollow Quartz Cylinder, *C.R.*, vol. 204, pp. 226-228, 1937.
526. TSI-ZE, NY, and S. KENG-YI: Vibrations in Quartz Plates Cut in Different Planes Around the Optic Axis, *C.R.*, vol. 204, pp. 1059-1060, 1937.
527. TSI-ZE, NY, and CHUNG MING-SAN: States of Vibration of a Hollow Quartz Cylinder, *J. phq.*, vol. 9, pp. 52-56, 1938.
528. TSI-ZE, NY, and F. SUN-HUNG: On the Circumferential Vibration of a Hollow Cylindrical Quartz Oscillator, *Chinese J. of Phys.*, vol. 2, pp. 145-153, 1936.
529. TSI-ZE, NY, and F. SUN-HUNG: On the Transverse Circular Vibrations of a Hollow Quartz Cylinder, *C.R.*, vol. 203, pp. 461-463, 1936.
530. TSI-ZE, NY, and LING-CHAO TSIEN: Oscillations with Hollow Quartz Cylinders Cut along the Optical Axis, *Nature*, vol. 134, pp. 214-215, 1934.
531. TSI-ZE, NY, and LING-CHAO TSIEN: Electrification by Torsion in Quartz Crystals, *C.R.*, vol. 198, pp. 1395-1396, 1934.
532. TSI-ZE, NY, and LING-CHAO TSIEN: The Laws of Liberation of Electricity by Torsion in Quartz Crystals, *C.R.*, vol. 199, pp. 1101-1102, 1934.
533. TSI-ZE, NY, and LING-CHAO TSIEN: Oscillations of a Hollow Quartz Cylinder, *C.R.*, vol. 200, pp. 565-567, 1935.
534. TSI-ZE, NY, and LING-CHAO TSIEN: On the Laws of Production of Electrification by Torsion in Quartz, *C.R.*, vol. 200, pp. 732-733, 1935.
535. TSI-ZE, NY, and LING-CHAO TSIEN: Electrification by Torsion in Quartz Crystal, *Chinese J. of Phys.*, vol. 1, pp. 41-53, October, 1935.
536. TSI-ZE, NY, LING-CHAO TSIEN, and FANG SUN-HUNG: Oscillations of Hollow Quartz Cylinders Cut along the Optic Axis, *Proc. I.R.E.*, vol. 24, pp. 1484-1494, 1936.
537. TYKOCINSKI-TYKOCINER, J., and M. W. WOODRUFF: Flexural Vibrations of Piezoelectric Quartz Bars and Plates, *Univ. Illinois Bull.*, vol. 34, 33 pp., Jan. 8, 1937 (No. 291).
538. UDA, S., S. HONDA, and H. WATANABE: Ultra-short-wave Quartz Oscillator, *Electrotech. Jour. (Jap.)*, vol. 2, pp. 94-95, 1938.
539. UST'YANOV, V. I.: On the Effect of a Layer of Gold Deposited on a Quartz Crystal on the Logarithmic Decrement of the Crystal, *Izv. El. Slab. Toka*, no. 4, pp. 44-48, 1938.
540. USUI, R.: The Circle Diagrams of the Quartz Oscillator, *J.I.E.E. (Japan)*, vol. 54, pp. 201-213, 1934; English summary, pp. 21-24.
541. VALASEK, J.: Piezoelectricity and Allied Phenomena in Rochelle Salt, *Phys. Rev.*, vol. 17, pp. 475-481, 1921.
542. VALASEK, J.: Piezoelectric Activity of Rochelle Salt under Various Conditions, *Phys. Rev.*, vol. 19, pp. 478-491, 1922.
543. VALASEK, J.: Properties of Rochelle Salt Related to the Piezoelectric Effect, *Phys. Rev.*, vol. 20, pp. 639-664, 1922.
544. VALASEK, J.: Dielectric Anomalies in Rochelle Salt Crystals, *Phys. Rev.*, vol. 24, pp. 560-568, 1924.
545. VALASEK, J.: Note on the Piezoelectric Effect in Rochelle Salt Crystals, *Science*, vol. 65, pp. 235-236, 1927.
546. VALASEK, J.: Infrared Absorption by Rochelle Salt Crystals, *Phys. Rev.*, vol. 45, pp. 654-655, 1934.

547. VAN DYKE, K. S.: The Electric Network Equivalent of a Piezoelectric Resonator (abst.), *Phys. Rev.*, vol. 25, p. 895, 1925.
548. VAN DYKE, K. S.: The Use of the Cathode Ray Oscillograph in the Study of Resonance Phenomena in Piezoelectric Crystals (abst.), *Phys. Rev.*, vol. 31, p. 303, 1928.
549. VAN DYKE, K. S.: Some Experiments with Vibrating Quartz Spheres (abst.), *Proc. I.R.E.*, vol. 16, pp. 706-707, 1928; *Phys. Rev.*, vol. 31, pp. 1113, 1133, 1928 (absts.).
550. VAN DYKE, K. S.: The Piezoelectric Resonator and Its Equivalent Network, *Proc. I.R.E.*, vol. 16, pp. 742-764, 1928.
551. VAN DYKE, K. S.: The Measurement of the Decrement of Piezoelectric Resonators (abst.), *Proc. I.R.E.*, vol. 18, p. 1989, 1930.
552. VAN DYKE, K. S.: The Electric Network Equivalent of a Piezoelectric Resonator (abst.), *Phys. Rev.*, vol. 40, p. 1026, 1932.
553. VAN DYKE, K. S.: Temperature Variation of Viscosity and of the Piezoelectric Constant of Quartz (abst.), *Phys. Rev.*, vol. 42, p. 587, 1932.
554. VAN DYKE, K. S.: A Determination of Some of the Properties of the Piezoelectric Quartz Resonator, *Proc. I.R.E.*, vol. 23, pp. 386-392, 1935. Document AG, No. 24, *Comm. I., U.R.S.I. Gen. Assem.*, 1934.
555. VAN DYKE, K. S.: Note on a Peculiar Case of Fracture of a Quartz Resonator, *J. Appl. Ph.*, vol. 8, pp. 567-568, 1937.
556. VAN DYKE, K. S.: Some Unusual Demonstrations with Piezoelectric Resonators (abst.), *Phys. Rev.*, vol. 53, p. 686, 1938.
557. VAN DYKE, K. S.: Vibration Modes of Low Decrement for a Quartz Ring (abst.), *Phys. Rev.*, vol. 53, p. 945, 1938.
558. VAN DYKE, K. S.: On the Right- and Left-handedness of Quartz and Its Relation to Elastic and Other Properties, *Proc. I.R.E.*, vol. 28, pp. 399-406, 1940.
559. VAN DYKE, K. S., and A. M. THORNDIKE: The Three-crystal Method of Quartz Resonator Measurement (abst.), *Phys. Rev.*, vol. 57, p. 560, 1940.
560. VECCHIACCHI, F.: Frequency-stability of Piezoelectric Standards, *L'Elettrot.*, vol. 15, pp. 462-468, 1928.
561. VECCHIACCHI, F.: Piezo-oscillators with Great Frequency-stability, *L'Elettrot.*, vol. 18, pp. 79-82, 1931; *Livorno Publication* 55.
562. VECCHIACCHI, F.: Advances in Piezoelectric Frequency Standards and Stabilizers, *Rass. P.T.T.*, vol. 10, pp. 5-8, October 1931.
563. VEEN, A. L. W. E. VAN DER: Symmetry of Diamond, thesis, Delft, 1911. *ZS. Kr.*, vol. 51, pp. 545-590, 1913.
564. VENKOV, M. M.: Principles in Designing a Crystal Holder for a Piezo-quartz Stabilizer, *Izv. El. Slab. Toka*, no. 6, pp. 39-44, no. 7, pp. 35-41, 1935.
565. VIGNESS, I.: Inverse Piezoelectric Properties of Rochelle Salt, *Phys. Rev.*, vol. 46, pp. 255-257, 1934.
566. VIGNESS, I.: Dilatations in Rochelle Salt, *Phys. Rev.*, vol. 48, pp. 198-202, 1935.
567. VIGOUREUX, J. E. P.: Development of Formulas for the Constants of the Equivalent Electrical Circuit of a Quartz Resonator in Terms of Elastic and Piezoelectric Constants, *Phil. Mag.*, vol. 6, pp. 1140-1153, 1928.
568. VIGOUREUX, J. E. P.: The Valve-maintained Quartz Oscillator, *J.I.E.E. (London)*, vol. 68, pp. 265-295, 1930; discussion, pp. 867-872; *Proc. Wireless Section, I.E.E.*, vol. 5, pp. 41-71, 1930; discussion, pp. 163-168.
569. VOIGT, W.: General Theory of the Piezo- and Pyroelectric Properties of Crystals, *Abh. Gött.*, vol. 36, pp. 1-99, 1890.
570. VOIGT, W.: Can the Pyroelectricity of Crystals Be Attributed Entirely to

- Piezoelectric Effects? *Nachr. Gött.*, pp. 166–194, 1898; *An. Phk.*, vol. 66, pp. 1030–1060, 1898.
571. VOIGT, W.: On Pyroelectricity in Centro-symmetrical Crystals, *Nachr. Gött.*, pp. 394–437, 1905.
572. VOIGT, W.: Remarks on Some New Investigations on Pyro- and Piezoelectricity of Tourmaline, *An. Phk.*, vol. 46, pp. 221–230, 1915.
573. VOIGT, W.: Theory and Experiments on Piezoelectric Excitation of a Cylinder by Torsion and Bending, *An. Phk.*, vol. 48, pp. 433–448, 1915.
574. VOIGT, W.: Questions on the Pyro- and Piezoelectricity of Crystals, *Phys. ZS.*, vol. 17, pp. 287–293, 307–313, 1916.
575. VOIGT, W.: Pyro- and Piezoelectricity. Experimental Determination of Permanent Centro-symmetrical Moments, *Phys. ZS.*, vol. 18, pp. 59–67, 1917.
576. VOIGT, W., and V. FRÉEDERICKSZ: Piezoelectric Excitation of a Cylinder by Torsion and Bending, *An. Phk.*, vol. 48, pp. 145–176, 1915.
577. WACHSMUTH, R., and H. AUER: Mechanical Vibrations of Piezoelectrically Excited Quartz, *ZS. Ph.*, vol. 47, pp. 323–329, 1928.
578. WAGNER, K. W.: Wedge-shaped Piezoelectric Resonators, *Hfr. u. El. ak.*, vol. 47, p. 28, 1936.
579. WARREN, B. E., and H. M. KRUTTER: X-ray Study of Crystal Structure of Rochelle Salt and Effect of Temperature (abst.), *Phys. Rev.*, vol. 43, p. 500, 1933.
580. WATAGHIN, G., and G. SACERDOTE: Optical Examination of the Surface of Piezoelectric Quartz in Vibration; Doppler Effect of Acceleration, *Atti. accad. sci. Torino*, vol. 66, pp. 424–427, 1930–1931.
581. WATANABE, Y.: Piezoelectric Resonator in High-frequency Oscillation Circuits, *Proc. I.R.E.*, vol. 18, pp. 695–717, 862–893, 1930; *ENT*, vol. 5, pp. 45–64, 1928.
582. WHEELER, L. P.: An Analysis of a Piezoelectric Oscillator Circuit, *Proc. I.R.E.*, vol. 19, pp. 627–646, 1931.
583. WHEELER, L. P., and W. E. BOWER: A New Type of Standard Frequency Piezoelectric Oscillator, *Proc. I.R.E.*, vol. 16, pp. 1035–1044, 1928.
584. WILLARD, G. W.: Raw Quartz, Its Imperfections and Inspection, *Bell Syst. T.J.*, vol. 22, pp. 338–361, 1943.
585. WILLARD, G. W.: Inspecting and Determining the Axis Orientation of Quartz Crystals, *Bell Labs. Rec.*, vol. 22, pp. 320–326, 1944.
586. WILLARD, G. W.: Use of the Etch Technique for Determining Orientation and Twinning in Quartz Crystals, *Bell Syst. T.J.*, vol. 23, pp. 11–51, 1944.
587. WILLIAMS, N. H.: Modes of Vibration of Piezoelectric Crystals, *Proc. I.R.E.*, vol. 21, pp. 990–995, 1933.
588. WILSON, A. J. C.: The Heat Capacity of Rochelle Salt between -30° and $+30^\circ\text{C}$., *Phys. Rev.*, vol. 54, pp. 1103–1109, 1938.
589. WOLF, K.: Flexural Oscillations in a Thin Rod, *Ber. Wien*, vol. 143, pp. 79–86, 1934.
590. WOLOGDIN, V.: Frequency Multiplication by the Use of a Condenser with Rochelle Salt Dielectric, *ZS. tech. Ph.*, vol. 13, pp. 82–84, 1932.
591. WOOD, R. G., and C. H. McCALE: Simple Apparatus for Detecting the Pyroelectric Effect in Crystals, *J. Sci. Instr.*, vol. 17, pp. 225–226, 1940.
592. WOROBIEFF, V. von: Crystallographic Studies of Tourmaline from Ceylon and Several Other Sources, *ZS. Kr.*, vol. 33, pp. 263f., 1900.
593. WRIGHT, J. W.: The Piezoelectric Crystal Oscillator, *Proc. I.R.E.*, vol. 17, pp. 127–142, 1929.
594. WRIGHT, R. B., and D. M. STUART: Some Experimental Studies of the Vibrations of Quartz Plates, *J. Res. N.B.S.*, vol. 7, pp. 519–553, 1931.

595. YODA, H.: Thermal Characteristics of Piezoelectric Oscillating AT-cut and YT-cut Plates, *R.R.R.W. Jap.*, vol. 5, pp. 77-87, 1935.

596. YODA, H.: YT-cut Quartz Plates, *Electrot. Jour. (Jap.)*, vol. 2, p. 96, 1938.

597. ZACEK, A., and V. PETRZILKA: On Wedge-shaped Piezoelectric Resonators, *Hfr. u. El. ak.*, vol. 46, pp. 157-159, 1935; *Czech. Inst. Elec. Eng.*, vol. 24, 1935.

598. ZACEK, A., and V. PETRZILKA: Radial and Torsional Vibrations of Annular Quartz Plates, *Phil. Mag.*, vol. 25, pp. 164-175, 1938.

599. ZAKS, E. S., and V. P. UFTIUJANINOV: Low-frequency Luminous Piezo-quartz Resonators, *Izv. El. Slab. Toka*, no. 1, pp. 32-40, January-February, 1934.
ZE, NY TSI—see TSI-ZE.

600. ZELENÝ, A., and J. VALASEK: Variation of the Dielectric Constant of Rochelle Salt Crystals with Frequency and Applied Field Strength, *Phys. Rev.*, vol. 46, pp. 450-453, 1934.

601. ZELYAKH, E. V., and Y. I. VELIKIN: Equivalent Circuits of the Four-electrode Quartz Resonator, *Izv. El. Slab. Toka*, no. 3, pp. 46-50, 1938.

602. ZWICKER, B., and P. SCHERRER: Electro-optical Behavior of KH_2PO_4 and KD_2PO_4 Crystals, *Helv. Ph. Ac.*, vol. 16, pp. 214-216, 1943.

A few references to publications after 1946 have been inserted here and there in the text. Still other references are given at the end of Appendix II.