

TABLE OF CONTENTS

FOREWORD	1
1. EXECUTIVE SUMMARY	4
2. IDENTITY AND PHYSICAL/CHEMICAL PROPERTIES	5
3. ANALYTICAL METHODS	6
4. SOURCES OF HUMAN AND ENVIRONMENTAL EXPOSURE	6
4.1 Natural sources	6
4.2 Anthropogenic sources	6
4.2.1 Production and use	6
4.2.2 Non-point sources	7
4.2.3 Point sources	7
5. ENVIRONMENTAL TRANSPORT, DISTRIBUTION, AND TRANSFORMATION	7
5.1 Air	8
5.2 Water	8
5.3 Soil and sediment	8
5.4 Biota	8
5.5 Environmental partitioning	8
6. ENVIRONMENTAL LEVELS AND HUMAN EXPOSURE	9
6.1 Environmental levels	9
6.1.1 Ambient air	9
6.1.2 Indoor air	10
6.1.3 Water, sediment and soil, and biota	10
6.1.4 Food	10
6.1.5 Consumer products	10
6.1.6 Medical devices	10
6.2 Human exposure: environmental	10
6.3 Human exposure: occupational	10
7. COMPARATIVE KINETICS AND METABOLISM IN LABORATORY ANIMALS AND HUMANS	11
8. EFFECTS ON LABORATORY MAMMALS AND <i>IN VITRO</i> TEST SYSTEMS	13
8.1 Single exposure	13
8.2 Short- and medium-term exposure	13
8.3 Long-term exposure and carcinogenicity	14
8.3.1 Chronic toxicity	14
8.3.2 Carcinogenicity	14
8.4 Genotoxicity and related end-points	16
8.5 Reproductive toxicity	17
8.5.1 Effects on fertility	17
8.5.2 Developmental toxicity	17
8.6 Neurotoxicity	17

8.7	Mechanisms of toxicity / mode of action	18
9.	EFFECTS ON HUMANS	18
9.1	Non-neoplastic effects.....	18
9.1.1	Irritation and sensitization.....	18
9.1.2	Reproductive effects.....	18
9.1.3	Neurological effects	19
9.1.4	Genetic effects.....	19
9.1.5	Other non-neoplastic effects	22
9.2	Cancer	22
10.	EFFECTS ON OTHER ORGANISMS IN THE LABORATORY AND FIELD	27
10.1	Aquatic organisms.....	27
10.1.1	Toxicity of breakdown products.....	28
10.2	Terrestrial organisms.....	28
11.	EFFECTS EVALUATION	28
11.1	Evaluation of health effects.....	28
11.1.1	Hazard identification.....	28
11.1.1.1	Carcinogenicity.....	28
11.1.1.2	Germ cell mutations.....	30
11.1.1.3	Non-neoplastic effects	30
11.1.2	Exposure-response analysis.....	30
11.1.2.1	Carcinogenicity.....	30
11.1.2.2	Germ cell mutations.....	32
11.1.2.3	Non-neoplastic effects	33
11.1.3	Sample risk characterization	33
11.1.4	Uncertainties and degree of confidence in human health risk characterization.....	33
11.2	Evaluation of environmental effects.....	34
11.2.1	Assessment end-points.....	34
11.2.2	Environmental risk characterization.....	35
11.2.3	Discussion of uncertainty.....	35
12.	PREVIOUS EVALUATIONS BY INTERNATIONAL BODIES	35
	REFERENCES.....	36
	APPENDIX 1 — SOURCE DOCUMENT.....	44
	APPENDIX 2 — CICAD PEER REVIEW	44
	APPENDIX 3 — CICAD FINAL REVIEW BOARD.....	45
	APPENDIX 4 — DERIVATION OF TC ₀₅	46
	APPENDIX 5 — LIST OF ACRONYMS AND ABBREVIATIONS.....	51
	INTERNATIONAL CHEMICAL SAFETY CARD.....	52
	RÉSUMÉ D'ORIENTATION.....	54
	RESUMEN DE ORIENTACIÓN	56