

TABLE OF CONTENTS

FOREWORD	1
1. EXECUTIVE SUMMARY	4
2. IDENTITY AND PHYSICAL/CHEMICAL PROPERTIES	6
3. ANALYTICAL METHODS	7
4. SOURCES OF HUMAN AND ENVIRONMENTAL EXPOSURE	8
4.1 Use of mono- and disubstituted organotins in PVC	9
4.2 Use of mono- and disubstituted organotins as catalysts	10
4.2.1 Electrodeposition	10
4.2.2 Silicones	10
4.2.3 Esterification and powder coating	11
4.2.4 Polyurethanes	12
4.3 Use of monobutyltin trichloride in glass coating	12
5. ENVIRONMENTAL TRANSPORT, DISTRIBUTION, AND TRANSFORMATION	12
6. ENVIRONMENTAL LEVELS AND HUMAN EXPOSURE	14
6.1 Environmental levels	14
6.1.1 Measured concentrations	14
6.1.2 Estimation of PECs	17
6.2 Human exposure	18
7. COMPARATIVE KINETICS AND METABOLISM IN LABORATORY ANIMALS AND HUMANS	18
8. EFFECTS ON LABORATORY MAMMALS AND IN VITRO TEST SYSTEMS	21
8.1 Single exposure	21
8.2 Irritation and sensitization	21
8.3 Short- and medium-term exposure	22
8.3.1 Neurotoxicity	23
8.3.2 Reproductive and developmental toxicity	23
8.3.3 Immunotoxicity	25
8.3.4 Endocrine disruption	27
8.4 Long-term exposure and carcinogenicity	27
8.5 Genotoxicity and related end-points	27
8.6 Other toxicities	32
8.7 Mode of action	32
9. EFFECTS ON HUMANS	32
10. EFFECTS ON OTHER ORGANISMS IN THE LABORATORY AND FIELD	33
10.1 Aquatic environment	33
10.2 Terrestrial environment	33

11. EFFECTS EVALUATION.....	33
11.1 Evaluation of health effects	33
11.1.1 Hazard identification and dose–response assessment	33
11.1.2 Criteria for setting tolerable intakes and tolerable concentrations.....	38
11.1.3 Sample risk characterization	38
11.2 Evaluation of environmental effects.....	41
11.2.1 Hazard identification	41
11.2.2 Derivation of PNECs in fresh water	41
11.2.3 Derivation of PNECs for marine organisms.....	42
11.2.4 Risk characterization	42
11.3 Uncertainties in the risk characterization	42
12. PREVIOUS EVALUATIONS BY IOMC BODIES	43
REFERENCES.....	43
APPENDIX 1 — ACRONYMS AND ABBREVIATIONS	52
APPENDIX 2 — SOURCE DOCUMENT	53
APPENDIX 3 — CICAD PEER REVIEW	53
APPENDIX 4 — CICAD FINAL REVIEW BOARD	54
INTERNATIONAL CHEMICAL SAFETY CARDS	55
RÉSUMÉ D'ORIENTATION.....	59
RESUMEN DE ORIENTACIÓN.....	62