



TABLE OF CONTENTS

FOREWORD

1. EXECUTIVE SUMMARY	4
2. IDENTITY AND PHYSICAL/CHEMICAL PROPERTIES	5
3. ANALYTICAL METHODS ..	6
4. SOURCES OF HUMAN AND ENVIRONMENTAL EXPOSURE	
4.1 Natural sources	7
4.2 Anthropogenic sources	7
4.3 Production and use	8
5. ENVIRONMENTAL TRANSPORT, DISTRIBUTION, AND TRANSFORMATION	8
5.1 Air	8
5.2 Water	8
5.3 Sediment	9
5.4 Soil	9
5.5 Biota	9
5.6 Environmental partitioning	9
6. ENVIRONMENTAL LEVELS AND HUMAN EXPOSURE ..	9
6.1 Environmental levels	10
6.1.1 Ambient air	10
6.1.2 Indoor air	10
6.1.3 Drinking-water	11
6.1.4 Surface water	11
6.1.5 Sediment and soil	11
6.1.6 Food	11
6.2 Human exposure: environmental	12
6.3 Human exposure: occupational .	12
7. COMPARATIVE KINETICS AND METABOLISM IN LABORATORY ANIMALS AND HUMANS	12
8. EFFECTS ON LABORATORY MAMMALS AND <i>IN VITRO</i> TEST SYSTEMS	13
8.1 Single exposure	13
8.2 Irritation and sensitization	15
8.3 Short- and medium-term exposure	15
8.3.1 Inhalation	15
8.3.2 Ingestion	16
8.3.3 Dermal exposure	17
8.4 Long-term exposure and carcinogenicity	17
8.5 Genotoxicity and related end-points	18
8.6 Reproductive toxicity	19
8.7 Neurotoxicity and effects on the immune system.	19
8.8 Mechanisms of toxicity / mode of action	19

9. EFFECTS ON HUMANS	20
10. EFFECTS ON OTHER ORGANISMS IN THE LABORATORY AND FIELD	21
10.1 Aquatic organisms . .	21
10.2 Terrestrial organisms	21
EFFECTS EVALUATION	22
11.1 Evaluation of health effects	22
11.1.1 Hazard identification and exposure–response assessment	22
11.1.1.1 Effects in humans	22
11.1.1.2 Effects in experimental animals	22
11.1.2 Criteria for setting tolerable intakes/concentrations or guidance values	23
11.1.2.1 Inhalation	23
11.1.2.2 Ingestion	26
11.1.3 Sample risk characterization	27
11.1.4 Uncertainties in the evaluation of health risks	27
11.2 Evaluation of environmental effects	27
11.2.1 Assessment end-points	27
11.2.2 Sample environmental risk characterization	28
11.2.2.1 Single exposure of terrestrial plants and animals	28
11.2.2.2 Long-term exposure of terrestrial plants and animals	29
11.2.3 Uncertainties in the evaluation of environmental risks	29
12. PREVIOUS EVALUATIONS BY INTERNATIONAL BODIES	30
REFERENCES	31
APPENDIX SOURCE DOCUMENT	39
APPENDIX 2 CICAD PEER REVIEW	39
APPENDIX 3 — CICAD FINAL REVIEW BOARD	40
INTERNATIONAL CHEMICAL SAFETY CARD	41
RÉSUMÉ D'ORIENTATION	43
RESUMEN DE ORIENTACIÓN	45