

CONTENTS

ENVIRONMENTAL HEALTH CRITERIA FOR CYHALOTHIN AND LAMBDA-CYHALOTHIN	
INTRODUCTION	12
1. SUMMARY, EVALUATION, CONCLUSIONS, AND RECOMMENDATIONS	15
1.1 Summary and evaluation	15
1.1.1 Identity, physical and chemical properties, analytical methods	15
1.1.2 Production and use	15
1.1.3 Human exposure	16
1.1.4 Environmental exposure and fate	16
1.1.5 Uptake, metabolism, and excretion	16
1.1.6 Effects on organisms in the environment	17
1.1.7 Effects on experimental animals and <i>in vitro</i> test systems	18
1.1.8 Effects on humans	20
1.2 Conclusions	20
1.3 Recommendations	21
2. IDENTITY, PHYSICAL AND CHEMICAL PROPERTIES, ANALYTICAL METHODS	22
2.1 Identity	22
2.2 Physical and chemical properties	24
2.3 Analytical methods	24
2.3.1 Sampling methods	25
2.3.2 Sample storage	26
2.4 Sample preparation	27
2.5 Gas chromatographic procedures for the determination of cyhalothrin residues	27
2.5.1 Extraction	27
2.5.2 Clean-up	28
2.5.3 Determination	28
2.5.4 Limit of determination	28
2.5.5 Recoveries and interference	29
2.5.6 Confirmation of residue identity	29
3. SOURCES AND LEVELS OF HUMAN AND ENVIRONMENTAL EXPOSURE	30
3.1 Production levels and processes	30

3.2	Uses	30
3.3	Residues in food	31
3.4	Levels in the environment	31
3.4.1	Air	31
3.4.2	Water	31
3.4.3	Soil	31
4.	ENVIRONMENTAL TRANSPORT, DISTRIBUTION, AND TRANSFORMATION	32
4.1	Transport and distribution between media	32
4.2	Abiotic degradation	32
4.2.1	Hydrolysis and photodegradation in water	32
4.2.2	Photodegradation in soil	34
4.3	Biodegradation in soil	34
4.3.1	Degradation rate	34
4.3.2	Degradation pathways	36
4.4	Metabolism in plants	36
4.5	Bioaccumulation and biomagnification	38
4.5.1	<i>n</i> -Octanol-water partition coefficient	38
4.5.2	Bioaccumulation	38
5.	KINETICS AND METABOLISM	42
5.1	Absorption, distribution, and excretion	42
5.1.1	Rat	42
5.1.2	Dog	44
5.1.3	Cow	45
5.2	Metabolism	46
5.2.1	Rat	46
5.2.2	Dog	49
5.2.3	Cow	49
5.2.4	Goat	50
5.2.5	Fish	50
6.	EFFECTS ON ORGANISMS IN THE ENVIRONMENT	51
6.1	Aquatic organisms	51
6.1.1	Microorganisms	51
6.1.2	Invertebrates	51
6.1.2.1	Acute toxicity	51
6.1.2.2	Long-term toxicity	51
6.1.3	Fish	51
6.1.3.1	Acute toxicity	51

6.1.3.2 Long-term toxicity	54
6.1.4 Model ecosystem	54
6.2 Terrestrial organisms	54
6.2.1 Birds	54
6.2.1.1 Acute toxicity	54
6.2.2 Honey-bees	56
6.2.3 Earthworms	56
6.2.4 Higher plants	57
7. EFFECTS ON EXPERIMENTAL ANIMALS AND <i>IN VITRO</i> TEST SYSTEMS	58
7.1 Single exposures	58
7.1.1 Oral	58
7.1.2 Percutaneous	58
7.1.3 Intraperitoneal	59
7.2 Irritation and sensitization	59
7.2.1 Irritation	59
7.2.2 Sensitization	60
7.3 Short-term exposures	60
7.3.1 Oral	60
7.3.1.1 Rat	60
7.3.1.2 Dog	62
7.3.2 Dermal	63
7.3.2.1 Rabbit	63
7.4 Long-term exposures and carcinogenicity	63
7.4.1 Rat	63
7.4.2 Mouse	64
7.5 Reproduction, embryotoxicity, and teratogenicity	64
7.5.1 Reproduction	64
7.5.2 Embryotoxicity and teratogenicity	65
7.5.2.1 Rat	65
7.5.2.2 Rabbit	66
7.6 Mutagenicity and related end-points	66
7.6.1 Microorganisms	66
7.6.2 <i>In vitro</i> mammalian cells	66
7.6.3 <i>In vivo</i> mammalian assays	67
7.7 Mode of action	68
8. EFFECTS ON HUMANS	69
8.1 General population exposure	69
8.2 Occupational exposure	69
8.2.1 Acute toxicity: poisoning incidents	69

8.2.2	Effects of short- and long-term exposure	69
8.2.2.1	Manufacture	70
8.2.2.2	Formulation and laboratory work	70
8.2.2.3	Field use	71
9.	PREVIOUS EVALUATIONS BY INTERNATIONAL BODIES	72
	REFERENCES	73
	APPENDIX	84
	RESUME, EVALUATION, CONCLUSIONS, ET RECOMMANDATIONS	91
	RESUMEN, EVALUACION, CONCLUSIONES Y RECOMENDACIONES	99