## CONTENTS

## ENVIRONMENTAL HEALTH CRITERIA FOR ACETONITRILE

1.	SUMMARY				13		
	1.1	.1 Properties, uses and analytical methods					
	1.2	1.2 Environmental levels and sources of human exposure					
		1.3 Environmental distribution and transformation					
			onmental		13 14		
	1.5	1.5 Absorption, distribution, biotransformation and					
		elimination					
	1.6	Effect	s on labo	oratory mammals	15		
			ts on hun		15		
2.	IDENTITY, PHYSICAL AND CHEMICAL PROPERTIES,						
		AND ANALYTICAL METHODS					
	2.1 Identity						
		2 Physical and chemical properties					
		2.2.1		1 properties	17 17		
		2.2.2		al properties	18		
	2.3				18		
	2.4						
		2.4.1		ination of acetonitrile in ambient air	20		
				Sampling methods	20		
				Measurement of acetonitrile in			
				collected air samples	20		
		2.4.2	Monito	ring methods for the determination of			
	acetonitrile and its metabolites in						
			biologic	cal materials	21		
			-	Acetonitrile in urine	21		
			2.4.2.2	Acetonitrile in serum	24		
			2.4.2.3	Acetonitrile metabolites in tissues			
				and biological fluids	24		
3.	SOURCES OF HUMAN AND ENVIRONMENTAL						
	EXPOSURE						
	3.1	Natura	al occurre	ence	29		
	3.2	.2 Anthropogenic sources					
		3.2.1		tion levels and processes	29 29		
		322	Llege		30		

4.	ENVIRONMENTAL TRANSPORT, DISTRIBUTION AND TRANSFORMATION			32		
	4.1	Transt	port and distribution between media	32		
		4.1.1	Water	32		
	4.2		Transformation			
	1.2	4.2.1 Biodegradation		32 32		
		1.2.1	4.2.1.1 Water and sewage sludge	32		
			4.2.1.2 Soil	33		
		4.2.2		34		
			4.2.2.1 Water	34		
			4.2.2.2 Air	34		
5.	ENVIRONMENTAL LEVELS AND HUMAN					
	EX	EXPOSURE				
	5.1			37		
		5.1.1	Air	37		
		5.1.2	Water and bottom sediment Food	37		
				37		
			Tobacco smoke	38		
			Other sources of exposure	38 38		
		Occupational exposure				
	5.3	Acetonitrile in various solvent products 39				
6.	KINETICS AND METABOLISM IN LABORATORY ANIMALS AND HUMANS					
	6.1	A boor	ention	40		
	0.1	Absorption 6.1.1 Human studies		40		
	,	6.1.2	Experimental animal studies	40		
		0.1.2	6.1.2.1 Intake through inhalation	40		
			6.1.2.2 Dermal absorption	40		
			6.1.2.3 Intake via the gastrointestinal tract	41		
	62	Distri		41		
	0.2	6.2.1		41		
			Experimental animal studies	41		
	6.3			41		
	0.5	6.3.1		41		
		6.3.2				
		in vitro studies				
			6.3.2.1 Cyanide liberation from acetonitrile 6.3.2.2 The oxidative pathway of acetonitrile	42		
			metabolism	46		
	6.4	Biological monitoring of acetonitrile uptake				

7.	EFFECTS ON LABORATORY MAMMALS; IN VITRO TEST SYSTEMS					
	TEST STSTEMS					
	7.1	Acute toxicity			51	
			Single e	xposure	51	
		7.1.2	Clinical	observations	51	
			7.1.2.1	Effect on skin	56	
			7.1.2.2	Effect on the eyes	56	
			7.1.2.3	Effect on respiration	56	
			7.1.2.4	Effect on adrenals	56	
			7.1.2.5	Effect on the gastrointestinal tract	57	
		7.1.3		nical changes and mechanisms of		
			acetonit	rile toxicity	57	
			7.1.3.1	Effect on cytochrome oxidase	57	
				Effect on glutathione	57	
		7.1.4	Antidot	es to acetonitrile	58	
	7.2	7.2 Subchronic toxicity				
				on exposure	58	
	7.2.2 Subcutaneous administration				61	
		Teratogenicity and embryotoxicity				
	7.4	Mutagenicity				
				ıl systems	67	
			Yeast as		67	
		7.4.3	Drosoph	nila melanogaster	67	
				lian in vivo assays	69	
		7.4.5	Chromo	some aberrations and sister chromatid		
			exchang		69	
		7.5 Carcinogenicity			69 69	
	7.6	7.6 Cytotoxicity testing				
8.	EFFECTS ON HUMANS					
	8.1	Acute toxicity				
				on exposure	71	
			Dermal		76	
		8.1.3	Oral exp	posure	77	
	8.2	Chronic toxicity			79	
	8.3					
	8.4				79	
	8.5	5 Chronic poisoning by cyanides				
		8.5.1	Ingestio	n	82	

9.	EFFECTS ON OTHER ORGANISMS IN THE				
	LABORATORY AND FIELD	83			
	9.1 Microorganisms	83			
	9.2 Aquatic organisms	83			
10.	EVALUATION OF HUMAN HEALTH RISKS AND				
	EFFECTS ON THE ENVIRONMENT				
	10.1 Evaluation of human health risks	87			
	10.2 Evaluation of effects on the environment	88			
11.	RECOMMENDATIONS FOR THE PROTECTION OF				
	HUMAN HEALTH	89			
12.	FURTHER RESEARCH	90			
13.	PREVIOUS EVALUATIONS BY INTERNATIONAL				
	BODIES	91			
REI	FERENCES	92			
RES	SUME	103			
RES	SUMEN	107			