



LIST OF BIOMARKER ANALYSES FOR HUMAN BIOMONITORING STUDIES FOLLOWING CHEMICAL INCIDENTS (Version 1.3–DEC 2013)

Dear user,

The intake of your request will be handled after sending the information below to emergency@humanbiologicalmonitoring.eu. The following information is required (complete separate request form in Word format):

Delivery address	Name contact person									
	Telephone number contact person									
	Name of your organisation									
	Delivery address: street + number (do not use a PO Box number)									
	Postal code and name of the city and country									
	Requested date and time of delivery									
Invoice address	Name contact person									
	Address: street + number									
	Postal code and name of the city and country									
Requested biomarker no.										
Number of requested samples										

Legen for the list of biomarkers

<u>Sampling material* codes</u>	<u>Code 1</u>	<u>Sample pretreatment codes (ir an 'R' if required before sending)</u>	<u>Code 2</u>	<u>Storage and transp</u>	<u>Code 3</u>	<u>Abbreviations:</u>	<u>Code 4</u>
EDTA-Monovette®	EDT	Plasma	PL	Ambient temperature	AT	Atomic absorption spectroscopy	AAS
Heparine-Monovette®	HEP	Erythrocytes	ER	Cooled (0-8 °C)	CT	Gas chromatography mass spectrometry	GC-MS
Serum-Monovette®	SER	Haemoglobin solution	HB	Frozen (< 0 °C)	FT	Gas chromatography tandem mass spectrometry	GC-MS/MS
Serum-Gel-Monovette®	SEG	Tenax adsorbent	TE	Other (specify): ____	XT	High performance liquid chromatography with UV-vis detection	HPLC-UV
Headspace Cuvette	HSC	Other (specify): _____	ZZ	_____		High performance liquid chromatography with UV-vis detection	HPLC-Flu
Urine-Monovette®	URM	Plasma	RPL	_____		Inductively-coupled plasma mass spectrometry	ICP-MS
BioVOC®	VOC	Erythrocytes	RER	_____		Liquid chromatography mass spectrometry	LC-MS
Neutral or LH Trace Metal	LHT	Haemoglobin solution	RHB	_____		Liquid chromatography tandem mass spectrometry	LC-MS/MS
						Photometric	PHM



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No	Substance	CAS no.	Biomarker	Medium	Materials sample collection	Sample pretreatment	Storage/transport	Detection method	LOQ (provide units)	Elimination half life in humans (h)
0010-1	Acetone	67-64-1	Acetone	urine	URM		CT	GC-MS	0.6 mg/L	
0020-1	Acetylcholinesterase inhibitors (organophosphates, carbamates)	-	Acetylcholinesterase	erythrocytes	EDT		CT/AT	Colorimetric	10 hU/L	32d
0030-1	Acrylamide	79-06-1	<i>N</i> -(Carbonamidethyl) valine from HB adduct	blood	EDT	RHB	FT	GC-MS/MS	4 pmol/g Globin	60 d
0030-2			Acrylamide mercapturic acid	urine	URM		AT	LC-MS/MS	1 µg/L	
0040-1	Acrylonitrile	107-13-1	<i>N</i> -Cyanoethylvaline from HB adduct	blood	EDT	RHB	FT	GC-MS/MS	0.2 ng/g Globin	60 d
0040-2			Cyanoethylmercapturic acid 1-cyano-2-hydroxyethylmercapturic acid	urine	URM		FT	LC-MS/MS	1 µg/L	8 h [8]
0050-1	Aluminium (Al) and its inorganic compounds	7429-90-5	Aluminium	urine	URM		AT	ICP-MS	0.03 µg/L	~8h
0050-2				serum	EDT	PL	AT	AAS	0.5 µg/L	
0060-1	4-Aminobiphenyl	92-67-1	4-Aminobiphenyl from HB adducts	blood	EDT	RER	CT	GC-MS	3 ng/L	60 d
0060-2			4-aminobiphenyl	urine	URM		FT	GC-MS	1.5 ng/L	~9 h
0070-1	Aniline	62-53-3	Aniline	urine	URM		AT	GC-MS	1.0µg/L	3 h (BEI)
0070-2			<i>p</i> -Aminophenol	urine	URM		FT	GC-MS/MS	5 µg/L	
0070-3			Aniline Hb adducts	blood	EDT	RER	CT	GC-MS	3 ng/L	60 d
0080-1	Antimony (Sb)	7440-36-0	Antimony	urine	URM		AT	ICP-MS	0.1 µg/L	24 h (BAT)
0090-1	Arsenic (As), elemental and soluble inorganic compounds	7440-38-2	As (inorganic and methylated metabolites)	urine	URM		AT	LC-ICP-MS	0.001 µg/L	2 d (BAT)
0090-2				blood	EDT		CT	AAS	2 µg/L	
0100-1	Arsenic trioxide (As ₂ O ₃)	1327-53-3	Arsenic	urine	URM		AT	LC-ICP-MS	1 ng/L	2 d (BAT)
0100.2				blood	EDT		CT	AAS	2 µg/L	
0110-1	Benzene	71-43-2	<i>S</i> -Phenylmercapturic acid	urine	URM		CT	LC-MSMS	0.5 µg/L	9 h (BEI)
0110-2			<i>t,t</i> -Muconic acid	urine	URM		FT	LC-MS/MS	10 µg/L	
0110-3			blood	HSC		AT	GC-FID	1 µg/L	0.7–4 h (BAT)	
0120-1	Benzidine and its salts	92-87-5	Benzidine	urine	EDT		CT	GC-MS	1 µg/L	
0120-2			Benzidine Hb adducts	blood						
0130-1	Beryllium and its compounds	7440-41-7	Beryllium	urine	URM		AT	ICP-MS	0.006µg/L	
0140-1	Bisphenol A (4,4'-isopropylidenediphenol)	80-05-7	Bisphenol A (hydrolytically released)	urine	URM		FT	LC-MS/MS	0.5 µg/L	
0140-2				blood	HSC		AT	GC-MSMS	0.1 µg/L	2–6 h (HBM)
0150-1	1,3-Butadiene	106-99-0	1,2-Dihydroxy-4-(<i>N</i> -acetylcysteiny)butane	urine	URM		AT	LC-MSMS	4 µg/L	1 d (BAT)



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No	Substance	CAS no.	Biomarker	Medium	Materials sample collection	Sample pretreatment	Storage/transport	Detection method	LOQ (provide units)	Elimination half life in humans (h)
0150-2			1-Hydroxy-2-(N-acetylcysteinyl)-3-butene	blood	URM		FT	LC-MS/MS	0.5 µg/L	~ 9 h
0150-3			<i>N</i> -1 and <i>N</i> -2(Hydroxybutenyl)valine	blood						
0160-1	1-Butanol	71-36-3	1-Butanol	urine	URM		CT	GC-MS	0.07 mg/L	
0161-1	2-Butanone (methyl ethyl ketone)	78-93-3	2-Butanone	Blood	HSC					
0161-2				Urine	URM	CT	GC-MS	0.05 mg/L		
0170-1	2-Butoxyethanol	111-76-2	Butoxyacetic acid	urine	URM	---	FT	LC-MS/MS	0.5 mg/L	
0180-1	2-Butoxyethanol acetate	112-07-2	Butoxyacetic acid	urine	URM		AT	GC-MS	0.01 mg/L	6 h (BAT)
0180-2	2-(2-Butoxyethoxy)ethanol or its acetate	112-34-5 / 124-17-4	2-(2-Butoxyethoxy)acetic acid	urine	URM		AT	GC-MS	0.01 mg/L	
0190-1	<i>p</i> -tert-Butylphenol	98-54-4	<i>p</i> -tert-Butylphenol	urine	URM		CT	GC-MS	0.2 mg/L	
0200-1	Cadmium (Cd) and its inorganic compounds	7440-43-9	Cadmium	urine	URM		AT	ICP-MS	0.05 µg/L	
0200-2				blood	EDT	AT	ICP-MS	0.05 µg/L	5 d (BAT)	
0200-3			Retinol-binding protein	urine	URM		AT	ELISA	5 µg/L	
0210-1	Carbon disulfide	75-15-0	2-Thiothiazolidine-4-carboxylic acid	urine	URM	---	FT	LC-MS/MS	10 µg/L	6 h (BEI)
0220-1	Carbon monoxide (CO)	630-08-0	Carboxyhemoglobine	blood						
0230-1	Carbon tetrachloride (tetrachloromethane)	56-23-5	Carbon tetrachloride	blood	HSC		CT	GC-MS	0.3 µg/L	
0240-1	Chlorobenzene	108-90-7	4-Chlorocatechol	urine	URM		AT	LC-UV	0.2 mg/L	2 h (BEI)
0240-2			4-Chlorophenol	urine	URM	AT	GC-MS	0.2 µg/L	3 h (BEI)	
0241-1	Chlorpyrifos/Chlorpyrifos-methyl	2921-88-2	Trichloropyridinol	urine	URM		AT	GC-MS	1.0 µg/L	16h ^{12,13}
0250-1	Chromium (VI). water soluble fume (Cr)	7440-47-3	Chromium	urine	URM		AT	ICP-MS	0.05 µg/L	days-weeks (BAT)
0250-2				plasma	EDT	PL	AT	AAS	0.1 µg/L	days-weeks (BAT)
0250-3				blood	EDT	CT	AAS	0.5 µg/L		
0250-4				erythrocytes	EDT	RER	AT	AAS	0.1 µg/L	60 d
0260-1	Cobalt (Co) and inorganic cobalt compounds	7440-48-4	Cobalt	urine	URM		AT	ICP-MS	0.06 µg/L	0.5-60 d (BAT)
0260-2				blood	EDT	AT	ICP-MS	0.1 µg/L	0.5-60 d (BAT)	
0270-1	Copper (Cu) and inorganic copper compounds	7440-50-8	Copper	urine	URM		AT	ICP-MS	0.06 µg/L	
0270-2				serum	SER.SEG. EDT	RPL	CT	AAS	0.05 mg/L	
0280-1	Cresol (all isomers)	1319-77-3	Total cresol	urine	URM		AT	GC-MS	0.01 mg/L	3 h (BEI)
0290-1	Cumene (isopropylbenzene)	80-15-9	2-Phenyl-2-propanol	urine	URM		AT	GC-FID	0.5 mg/L	6.4 h



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No	Substance	CAS no.	Biomarker	Medium	Materials sample collection	Sample pretreatment	Storage/transport	Detection method	LOQ (provide units)	Elimination half life in humans (h)
0290-2			Cumene	blood	EDT		CT	GC-MS	1 µg/L	
0300-1	Cyanides and hydrocyanic acid	3017-23-0	Thiocyanate	urine	URM		FT	GC-MS	0.09 mg/L	~ 7 d
0300-2				serum	SER		FT	GC-MS	0.09 mg/L	~ 7 d
0300-3				serum						
0310-1	Cyclohexane	110-82-7	1,2-Cyclohexanediol	urine	URM		CT	GC-MS	1 mg/L	
0320-1	Cyclohexanol	108-93-0	Cyclohexanol	urine	URM		CT	GC-MS	0.5 mg/L	
0320-2			1,2-Cyclohexanediol	urine	URM		CT	GC-MS	1 mg/L	
0330-1	Cyclohexanone	108-94-1	Cyclohexanol	urine	URM		CT	GC-MS	0.5 mg/L	
0330-2			1,2-Cyclohexanediol	urine	URM		CT	GC-MS	1 mg/L	
0340-1	1,2-Dichlorobenzene	95-50-1	1,2-Dichlorobenzene	blood	EDT		CT	GC-MS	1 µg/L	
0340-2			3,4- and 4,5- Dichlorocatechol	urine						
0350-1	1,4-Dichlorobenzene	106-46-7	2,5-Dichlorophenol	urine	URM		AT	GC-MS	0.2 µg/L	5-7 d (BAT)
0351-1	1,1-dichloroethane	75-34-3	1,1-dichloroethane	Blood	HSC		CT	GC-MS	1 µg/L	
0351-2	1,2-Dichloroethane	107-06-2	1,2-Dichloroethane	Blood	HSC		CT	GC-MS	0.3 µg/L	
0351-3	1,1-dichloroethene	75-35-4	1,1-dichloroethene	Blood	HSC		CT	GC-MS	1 µg/L	
0352-1	1,2-dichloroethene	540-59-0	1,2-dichloroethene	blood	HSC		CT	GC-MS	1 µg/L	
0360-1	Dichloromethane	75-09-2	Carbon monoxide	blood						
0360-2			Dichloromethane	urine	EDT		CT	GC-MS	1 µg/L	
0360-3			Dichloromethane	blood	EDT		CT	GC-MS	1 µg/L	30 min (MAK)
0370-1	2,2'-Dichloro-4,4'-methylene-dianiline (MbOCA)	78642-65-6	2,2'-Dichloro-4,4'-methylene-dianiline (MbOCA)	urine	URM		AT	GC-MS	1.3 µg/L	23h ³
0371-1	1,1-Dichloroethane	75-34-3	1,1-Dichloroethane	blood	HSC		CT	GC-MS	1 µg/L	
0372-1	1,2-Dichloroethane	107-06-2	1,2-Dichloroethane	blood	HSC		CT	GC-MS	0.3 µg/L	
0373-1	1,1-Dichloroethylene	75-35-4	1,1-Dichloroethylene	blood	HSC		CT	GC-MS	1 µg/L	
0374-1	1,2-Dichloroethylene	540-59-0	1,2-Dichloroethylene	blood	HSC		CT	GC-MS	1 µg/L	
0380-1	N,N-Dimethylacetamide (DMA)	127-19-5	N-methylacetamide	urine	URM		AT	GC-PND	0.2 mg/L	16 h (BAT)
0390-1	N,N-Dimethylformamide (DMF)	68-12-2	N-methylformamide	urine	URM		AT	GC-PND	0.2 mg/L	4 h (BEI)
0390-2			N-acetyl-S-(N-methylcarbamoyl)cysteine	urine	URM		AT	LC-MSMS	10 µg/L	20-30 h (BAT)
0400-1	Dimethylsulfate	77-78-1	N-methylvaline from Hb adduct	blood	EDT	RER	FT	GC-MS(/MS)	3 ng/g	~ 60 d



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No	Substance	CAS no.	Biomarker	Medium	Materials sample collection	Sample pretreatment	Storage/transport	Detection method	LOQ (provide units)	Elimination half life in humans (h)
0410-1	1,4-Dioxane	123-91-1	β -Hydroxyethoxyacetic acid	urine	URM		AT	GC-MS	0.5 mg/L	4 h (BAT)
0420-1	Diphenylmethane-4,4'-diisocyanate	101-68-8	4,4'-Diaminodiphenylmethane	urine	URM	---	FT	GC-MS/MS	0.01 μ g/L	
0421-1	Epichlorohydrin / glycidol	106-89-8/ 556-52-5	DHPV from Hb adducts	Blood	EDT	RHB	FT	GC-NCI-MS	5 ng/g globin	60 days
0430-1	2-Ethoxyethanol and 2-ethoxyethyl acetate	110-80-5 / 111-15-9	2-Ethoxyacetic acid	urine	URM		AT	GC-MS	0.01 mg/L	21-42 h (BAT)
0440-1	2-(2-Ethoxyethoxy)ethanol and its acetate	111-90-0 / 112-15-2	2-(2-Ethoxyethoxy)acetic acid	urine	URM		AT	GC-MS	10 μ g/L	
0450-1	Ethylbenzene	100-41-4	mandelic acid + phenylglyoxylic acid	urine	URM		CT	HPLC-UV	10 mg/L	6 h (BEI)
0450-2			Sum of 2- and 4-ethylphenol	urine	URM		AT	GC-MS	10 μ g/L	
0450-3			Ethylbenzene	end-exhaled air	VOC	RTE	AT	GC-MS	0.1 μ g/L	
0460-1	Ethylene	74-85-1	Hydroxyethylvaline from Hb adducts	blood	EDT	RHb	FT	GC-MS/MS	0.6 ng/g Globin	60 d
0460-2			Hydroxyethylmercapturic acid	Urine	URM	---	FT	LC-MS/MS	1 μ g/L	
0470-1	Ethylene glycol dinitrate	628-96-6	Ethylene glycol dinitrate	blood						
0480-1	Ethylene oxide	75-21-8	Hydroxyethylvaline from Hb adducts	blood	EDT	RHb	FT	GC-MS/MS	0.6 ng/g Globin	60 d
0480-2			Hydroxyethylmercapturic acid	Urine	URM	---	FT	LC-MS/MS	1 μ g/L	
0490-1	Fluorides (F) (hydrogen fluoride and inorganic fluorides)	109-86-4	Fluorides	serum	SER.SEG. EDT	RPL	CT	SPM	10 μ g/L	
0490-2				urine	URM	AT	0.1 μ g/L	12 h (BAT)		
0500-1	Formic acid and formates	64-18-6	Formic acid	urine						
0510-1	Furfural	98-01-1	Furoic acid	urine	URM		AT	GC-MS	1.1 mg/L	
0520-1	Glycerine trinitrate	55-63-0	Glycerine dinitrate	serum						
0521-1	C1-, C-2-haloalkanes. epoxides	-	Human glutathione-S-transferase T1	Blood	EDT	RHB	FT	HPLC-Fluorescence	n/a	n/a
0530-1	Halothane (2-bromo-2-chloro-1,1,1-trifluoroethane)	151-67-7	Trifluoroacetic acid	urine	URM		CT	GC-MS	0.1 mg/L	
0540-1	n-Heptane	142-82-5	n-Heptane	blood	HSC		AT	GC-FID	25 μ g/L	
0540-2			2,5-Heptanedion	urine						
0541-1	2-Heptanone	110-43-0	2-Heptanone	blood	HSC		CT	GC-MS	0.05 mg/L	
0550-1	Hexachlorobenzene	118-74-1	Hexachlorobenzene	plasma	EDT	PL	FT	GC/MS	0.01 μ g/L	
0550-2			Hexachlorobenzene	serum	EDTA	PL	AT	GC-MS	0.01 μ g/L	
0551-1	Hexamethylene-1,6-diisocyanate (HDI)	822-06-0	Hexamethylene-1,6-diamine (HDA)	urine	URM		CT	GC-MS	1 μ g/L	
0560-1		110-54-3	n-hexane	blood	URM		CT	GC-MS	0.2 mg/L	



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0560-2			2,5-Hexanedione	urine	URM		AT	GC-FID	0.3 mg/L	1.5-2 h (1)
0560-3			2,5-hexanedione + 4,5-dihydroxy-2-hexanone	urine	URM		AT	GC-MS	0.1 mg/L	
0561-1	2-Hexanone (Methyl n-butyl ketone)	591-78-6	Methyl n-butyl ketone (2-hexanone)	urine	URM		CT	GC-MS	0.05 µg/L	
0561-2			Methyl n-butyl ketone (2-hexanone)	blood	HSC		CT	GC-MS	0.05 mg/L	
0570-1	Hydrazine	302-01-2	Hydrazine	urine						
0570-2				plasma	EDT		CT	LC-MS	1 µg/L	2-4 h
0571-1	Hydrogen fluoride and inorganic fluorides)	109-86-4	Fluorides	serum	EDT	RPL	CT	SPM	10 µg/L	
0571-1	Hydrogen sulfide	7783-06-4	Thiosulphate	urine – survivors	URM		AT	GC-MS	0.1 mg/L	
0571-2				blood – fatalities	EDT		AT	GC-MS	0.1 mg/L	
0572-1	Isophoronediiisocyanate (IPDI)	4098-71-9	Isophoronediimine (IPDA)	urine	URM		CT	GC-MS	1 µg/L	
0580-1	Lead (Pb) inorganic	7439-92-1	Lead	blood	EDT		AT	ICP-MS	0.05 µg/L	
0580-2				urine	URM		AT	ICP-MS	0.05 µg/L	
0580-3				Urine	URM		AT			
0590-1	Lead (Pb) organic (teraethyllead)	78-00-2	Lead	urine	URM		AT	ICP-MS	0.05 µg/L	
0590-2			Diethyllead	urine						
0600-1	Lindane	58-89-9	Lindane	blood	EDT		CT	GC-MS	0.01 µg/L	21 h (1)
0600-2				plasma	EDT		CT	GC-MS	0.01 µg/L	20 h (BAT)
0600-3				serum	SER.SEG.EDT	RPL	CT	GC-MS	0.2 µg/L	
0610-1	Manganese (Mn) and its inorganic compounds	7439-96-5	Manganese	plasma	HEP		AT	ICP-MS	0.3 µg/L	
0610-2				blood	EDT		AT	ICP-MS	0.05 µg/L	40 d (BAT)
0610-3				serum	SER.SEG. EDT	RPL	CT	AAS	0.5 µg/L	
0620-1	Mercury (Hg)	7439-97-6	Mercury	Urine	URM		AT	ICP-MS	0.2 µg/L	
0620-2				urine	URM		AT	ICP-MS	0.1 µg/L	40 d (BAT)
0621-1	Mercury and its inorganic salts	7439-97-6	Mercury	blood	URM		AT	ICP-MS	0.1 µg/L	
0621-2	Mercury. organic	-		urine	URM		AT	ICP-MS	0.1 µg/L	
0630-1	Methanol	67-56-1	Methanol	blood	EDT		AT	ICP-MS	0.1 µg/L	70 d (BAT)
0640-1	Methemoglobin inducers	-	Methemoglobin	urine	URM		CT	GC-MS	30 µg/L	1.5-2 h (BAT)
0650-1	2-Methoxyethanol and 2-methoxyethyl acetate	109-86-4 /	2-Methoxyacetic acid	urine	URM		AT	GC-MS	0.01 mg/L	70 h (BAT)



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		110-49-6								
0660-1	2-(2-Methoxyethoxy)ethanol and 2-(2-Methoxyethoxy)acetate	111-77-3 / 629-38-9	2-(2-methoxyethoxy)acetic acid	urine	URM		AT	GC-MS	0.01 mg/L	
0670-1	1-Methoxy-2-propanol and 1-Methoxy-2-acetate	107-98-2 / 108-65-6	1-methoxy-2-propanol	urine	URM		AT	GC-FID	0.5 mg/L	4-5 h (BAT)
					URM		CT	GC-MS	0.09 mg/L	2.6h ⁸
0680-1	Methylbromide	74-83-9	Methylbromide	blood	HSC		CT	GC-MS	1 µg/L	
0680-2			Bromide	plasma	EDT	RPL	CT	SPM	1 mg/L	
0680-3				serum	SER.SEG.EDT	RPL	CT	SPM	1 mg/L	
0680-4			Methylbromide	blood	HSC		CT	GC-MS	1 µg/L	
0680-5			S-methylcysteine albumin adduct	blood						
0690-1	Methyl-t-butyl ether (MTBE)	1634-04-4	Methyl-t-butyl ether (MTBE)	blood	EDT		CT	GC-MS	10 µg/L	
0690-2				urine	URM		CT	GC-MS	90 µg/L	
0690-3				blood	EDT/HSC		CT	GC-MS	70 µg/L	
0690-4			t-Butyl alcohol	urine	URM		CT	GC-MS	70 µg/L	
0700-1	Methyl n-butyl ketone (2-hexanone)	591-78-6	Hexanedione + 4.5-dihydroxy hexan-2-one	urine	URM		AT	GC-MS	0.1 mg/L	
0700-2			2.5-Hexanedione	urine	URM		CT	GC-MS	0.05 µg/L	
0700-3			Methyl n-butyl ketone (2-hexanone)	blood	HSC		CT	GC-MS	50 µg/L	
0710-1	Methylenebis(2-chloroaniline) (MOCA)	101-14-4	Methylenebis(2-chloroaniline) (MOCA)	urine	URM		CT	GC-MS	1 µg/L	23h ³
0720-1	4.4'Methylenedianiline (MDA)	101-77-9	4.4'Methylenedianiline (MDA)	urine	URM		FT	GC-MS/MS	0.01 µg/L	
0730-1	4,4'-Methylenediphenyl-diisocyanate (MDI)	101-68-8	4.4'-methylenedianiline	urine	URM		FT	GC-MS	5 ng/L	4 h (BAT)
0730-2			5-isopropyl-3[4-(4-aminobenzyl) phenyl] hydantoin (MDA-Val-Hyd)	Blood	EDT	RHB	FT	GC-MS-NCI	0.2 ng/g globin	60 d
0740-1	Methyl chloroform	71-55-6	Methyl chloroform	end-exhaled air	VOC	RTE	AT	GC-MS	0.1 µg/L	
0740-2			Trichloroacetic acid	urine	URM		AT	LC-MS/MS	0.5 µg/L	50-100 h (BEI)
0740-3			Total trichloroethanol	urine	URM		CT	GC-MS	0.1 mg/L	
0740-4				blood	EDT		CT	GC-MS	0.1 mg/L	
0750-1	Methyleneiodide (Diiodomethane)	75-11-6	Carboxyhaemoglobin	blood						
0760-1	Methylethyl ketone (2-butanone)	78-93-3	2-Butanone	blood	HSC		CT	GC-MS	0.05 mg/L	1.5h ⁹
0761-1	Methyl n-butyl ketone (2-hexanone)	591-78-6	Methyl n-butyl ketone (2-hexanone)	urine	URM		CT	GC-MS	0.05 µg/L	
0761-2			Methyl n-butyl ketone (2-hexanone)	blood	HSC		CT	GC-MS	0.05 mg/L	



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No	Substance	CAS no.	Biomarker	Medium	Materials sample collection	Sample pretreatment	Storage/transport	Detection method	LOQ (provide units)	Elimination half life in humans (h)	
0770-1	Methylformiate	107-31-3	Methanol	urine	URM		CT	GC-MS	0.6 mg/L		
0770-2			Formic acid	urine							
0780-1	Methylisobutyl ketone (4-methyl-2-pentanone)	108-10-1	4-Methyl-2-pentanone	urine	URM		CT	GC-MS	0.02 mg/L	40 min (BEI)	
0790-1	N-Methyl-2-pyrrolidone	872-50-4	5-Hydroxy-N-methyl-2-pyrrolidone	urine	URM		FT	GC/MS	0.1 mg/L	7 h (BAT)	
0800--1	Molybdene (Mb) and its compounds except Molybdenetrioxide	7439-98-7	Molybdene	urine	URM		AT	ICP-MS	0.1 µg/L	1 d (BAT)	
0800-2				plasma	HEP		AT	ICP-MS	0.2 µg/L	1-30 h (BAT)	
0810-1	Naphthalene and mixtures of polycyclic aromatic hydrocarbons	91-20-3	1- and 2-Naphthol	urine	URM	---	FT	GC/MS	0.1 µg/L	Biphasisch(7) : 1-2 h. 14-46	
0820-1	2-Naphthylamine	91-59-8	2-Naphthylamine	urine	URM		AT	GC-MS	0.2 µg/L		
0820-2			2-Naphthylamine from Hb adducts	blood	EDT	RER	CT	GC-MS	3 ng/L	60 d	
0830-1	Naphthylene-1.5-diisocyanate (NDI)	3173-72-6	Naphthylene -1.5-diamine (NDA)	urine	URM		CT	GC-MS	0.3 µg/L		
0831-1	1.5-Naphthylenediamine	2243-62-1	1.5-Diaminonaphthaline	urine	URM		FT	GC/MS/MS	0.5 µg/L		
0840-1	Nickel (metal. oxide. carbonate. sulfide and sulfidic ores)	7440-02-0	Nickel	urine	URM		AT	ICP-MS	0.06 µg/L	1-1.5 d (BAT)	
0840-2				blood	EDT	CT	AAS	1 µg/L			
0840-3	Nickel. soluble compounds	-	Nickel	urine	URM		AT	ICP-MS	0.06 µg/L	11 h (BAT)	
0840-4				blood	EDT	CT	AAS	1 µg/L			
0850-1	Nitrobenzene	98-95-3	p-Nitrophenol	urine	URM		CT	GC-MS	1 µg/L		
0850-2			Methaemoglobin	blood							
0850-3			Aniline form Hb adducts	blood	EDT	RER	CT	GC-MS	3 ng/L	60 d	
0860-1	Nitroglycerine	55-63-0	Nitroglycols	urine	URM		AT	LC-MS/MS	0.1 µg/L		
0870-1	Nitrous oxide	10024-97-2	Nitrous oxide	urine							
0871-1	Organophosphates inducing OPIDN	n/a	Neuropathy target esterase (NTE)	Blood	EDT	lymphocytes in lab (6 -12 h after sampling)	AT	Photometry	n/a	n/a	
0880-1	Parathion	56-38-2	Cholinesterase	erythrocytes	EDT		CT/AT	Colorimetric	10 hU/L	32d	
0880-2				p-Nitrophenol	urine	URM		CT	GC-MS	1 µg/L	
					urine	URM		AT	GC-MS	0.1 mg/L	
0890-1	Pentachlorophenol (PCP)	87-86-5	PCP	urine							



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No	Substance	CAS no.	Biomarker	Medium	Materials sample collection	Sample pretreatment	Storage/transport	Detection method	LOQ (provide units)	Elimination half life in humans (h)
0890-2					URM	---	FT	GC/MS	0.1 µg/L	13-33 h (BAT)
0890-3				plasma	EDT	RPL	FT	GC/MS	0.1 µg/L	12-17 days (5)
0900-1	Perfluorooctanoic acids and their inorganic salts	335-67-1	Perfluorooctanoic acid	serum	EDT	PL	CT	LC-MS/MS	0.1 µg/L	2.5 y (BAT)
0910-1	Phenol	108-95-2	Phenol	urine	URM		AT	GC-MS	0.1 µg/L	3-4 h (BEI)
0911-1	Platinum	7440-06-4	Platinum	urine	URM		AT	ICP-MS Voltammetry	1.9 ng/L	
0920-1	Polychlorinated biphenyls (PCBs)	13336-36-3	PCB sum of 6 isomers	serum	EDT		CT	GC-MS	0.01 µg/L	Month to years
0920-2			PCB sum of 24 isomes	serum	EDT	PL	CT	GC-MS	0.01 µg/L	3-30 y (MAK)
0930-1	Polycyclic aromatic hydrocarbons (PAHs)	130498-29-2	1-Hydroxypyrene	urine	URM		AT	LC-Flu	16 ng/L	1-2 d (BAT)
0940-1	2-Propanol	71-23-8	Acetone	urine	URM		CT	GC-MS	0.06 mg/L	
0940-2				blood	EDT	CT	GC-MS	0.06 mg/L	2 h (BEI)	
0950-1	Propylene oxide	75-56-9	2-hydroxypropylmercapturic acid	Urine	URM	---	FT	LC-MS/MS	2 µg/L	
0950-2			N-2-hydroxypropylvaline from Hb adducts	Blood	EDT	RHb	FT	GC-MS/MS	0.7 ng/g Globin	
0960-1	Pyrethroids (e.g. cyfluthrin, cypermethrin, deltamethrin, permethrin, allethrin, resmethrin, phenothrin, tetramethrin)	28434-01-7 (resmethrin)	trans-Chrysanthemumdicarboxylic acid; 4-fluoro-3-phenoxybenzoic acid; cis- and trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclo-propane carbonic acid; cis-(2,2-dibrominyl)-dimethylcyclopropane carbonic acid	urine	URM	---	FT	GC-MS/MS	0.01 µg/L	3-12 h (BAT)
0960-2			Cis-Cl ₂ CA, trans-Cl ₂ -CA, Br ₂ CA, 3-PBA, F-PBA	Urine	URM		??	??	??	
0970-1	Selenium (Se)	7782-49-2	Selenium	urine	URM		AT	ICP-MS	0.2 µg/L	2-160 d (BAT)
0980-1	Sevoflurane	28523-86-6	Hexafluoro-2-propanol	urine	URM		CT	GC-MS	0.05 mg/L	
0990-1	Styrene	100-42-5	Sum of mandelic acid + phenylglyoxylic acid	urine	URM	---	FT	HPLC-UV	10 mg/L	3-4 h (BEI)
0990-2			Phenylhydroxyethyl-mercapturic acid	Urine	URM	---	FT	LC-MS/MS	0.3 µg/L	
0990-3			Styrene	blood	EDT	CT	GC-MS	1 µg/L		
1000-1	Thallium (Th)	7440-28-0	Thallium	urine	URM		AT	ICP-MS	0.05 µg/L	
1010-1	1,1,2,2-Tetrachloroethane	79-34-5	1,1,2,2-Tetrachloroethane	blood	HSC		CT	GC-MS	1 µg/L	
1011-1	Tetrachloroethylene	127-18-4	Tetrachloroethylene	end-exhaled air	VOC	RTE	AT	GC-MS	0.2 µg/L	



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No	Substance	CAS no.	Biomarker	Medium	Materials sample collection	Sample pretreatment	Storage/transport	Detection method	LOQ (provide units)	Elimination half life in humans (h)
				blood	EDT		CT	GC-MS	1 µg/L	33-72 h (1)
1020-1	Tetrahydrofuran (THF)	109-99-9	THF	urine	EDT		CT	GC-MS	5 µg/L	
1030-1	Toluene	108-88-3	o-Cresol	urine	URM		FT	GC/MS	10 µg/L	
1030-2			Hippuric acid	urine	URM		CT	GC-MS	1 µg/L	
1030-3			Toluene	blood	EDT		CT	GC-MS	1 µg/L	
1030-4										
1040-1	2,4- and 2,6-toluene diisocyanate (TDI)	26471-62-5	2,4- and 2,6-toluenediamine	urine	URM	---	FT	GC-MS/MS	0.01 µg/L	
1050-1	2,4-Toluylenediamine	95-80-7	2,4-Toluyenediamine	urine	URM	---	FT	GC-MS/MS	0.01 µg/L	
1060-1	1,1,1-Trichloroethane	71-55-6	1,1,1-Trichloroethane	blood	HSC		CT	GC-MS	1 µg/L	
1061-1	Trichloroethylene	79-01-6	Trichloroacetic acid	blood	URM		CT	SPM	3 mg/L	50-100 h (BEI)
1061-2				urine	URM		AT	LC-MS/MS	0.5 µg/L	
1061-3			Trichloroethanol	blood	HSC		CT	GC-MS	0.3 µg/L	
1061-4				Urine	URM					
1061-5			Trichloroethylene	blood	HSC		AT	GC-ECD	0.2 µg/L	30-38 h (1)
1061-6				Urine						
1070-1	Triethylamine	121-44-8	Triethylamine	urine						
1080-1	Trimethylbenzene (all isomers)	25551-13-7	Dimethylbenzoic acids (all isomers)	urine	URM		AT	GC-MS	0.2 mg/L	3.5-6.5 h (BAT)
1081-1	Tungsten	7440-33-7	Tungsten	urine	URM		AT	ICP-MS	0.2 µg/L	
1090-1	Uranium	7440-61-1	Uranium	Urine	URM		AT	ICP-MS	0.01 µg/L	
1100-1	Vanadium (V) and its inorganic compounds	7440-62-2	Vanadium	urine	URM		AT	ICP-MS	0.10 µg/L	15-20 h (BAT)
1110-1	Vinyl chloride (VCM)	75-01-4	Thiodiglycolic acid	urine	URM		AT	GC-MS	0.01 mg/L	
1110-2			Vinylchloride	End-exhaled air	VOC		AT	TD-GC-MS	0.3 ng/L	
1120-1	Xylene. o-. m-. p- or mixed isomers	13330-20-7	Methylhippuric acid	urine	URM	---	FT	HPLC-UV	2 mg/L	
1120-2			Xylene	Blood	EDT		CT	GC-MS	1 µg/L	30 min (BAT)
1130-1	Zink (Zn)	74440-66-6	Zink	urine	URM		AT	ICP-MS	0.3 µg/L	



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No	Substance	CAS no.	Biomarker	Medium	Materials sample collection	Sample pretreatment	Storage/transport	Detection method	LOQ (provide units)	Elimination half life in humans (h)
1130-2				serum	SER.SEG. EDT	RPL	CT	AAS	0.15 mg/L	

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