Leading Questions for Classification of Waste in Practice

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Step by Step approach for Assessment of Hazardous Properties in Practise

1. In the individual decision to classify a waste all available information are taken into account, in particular:

- Description of the waste origin (e.g. raw materials, industrial processes, location of the waste generation)
- Safety data sheet of the substances in processes used
- Classification and labeling of intermediate and end products
- Documentation of known waste analyzes

Step by Step approach for Assessment of Hazardous Properties in Practise

- Possible contaminations which can be reasonable expected in such a waste should be taken into account for the assessment.
- In certain cases the analysis effort can be reduced with regard to the composition and origin of the waste by the exclusion of the presence of certain risks.

Step by Step approach for Assessment of Hazardous Properties in Practise

These information should allow to identify the appropriate

6 – digit waste code.

In case of a **mirror entry** or in case of **insufficient information** about the waste further assessment of the HP are undertaken.

Note:

If the presence of certain risk chrakteristics can be excluded due to the nature, origin or composition of the waste, analytical studies on these properties are not required.

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The following rules are to observe:

1. Investigation of the leachate

The chemical analysis of the aqueous leachate will provide the information whether the waste is displaying the hazardous property **HP15**.

Is the concentration of all parameters lower than the respective limit value, the hazardous properties HP1 to HP14 are examined.

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Leachate parameters in **mg/l**:

Parameter	Concentration Limit for Eluates [mg/l]
Antimony	> 0,07
Arsenic	> 0,2
Barium	> 10
Lead	> 1
Cadmium	> 0,1
Chrome, total	> 1
Copper	> 5
Nickel	> 1
Mercury	> 0,02
Selenium	> 0,05
Zinc	> 5
Cyanide, easily purgeable	> 0,5
Phenole	> 50

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2. Investigation of the Waste Composition

(Total Contents of Parameters in **mg/kg**)

- These parameters are to use for the chemical analysis of waste and the subsequent review for the assessment as hazardous or non-hazardous.

Concentration Limit for Total Contents [mg/kg]

Parameter	Concentration limt for total contents [mg/kg]
Metals	
Vanadium	25,000
Antimony	25,000
Copper	2,500
Cobalt	2,500
Silver	2,500
Barium	2,500
Zinc	2,500
Lead	2,500
Selen	2,500
Arsenic	1,000
Nickel	1,000
Chrome, Chrome-VI-compounds	1,000
Tin, organic compounds	1,000
Cadmium	1,000
Beryllium	1,000
Thallium	1,000
Mercury	1,000
Organic compounds	
Petroleum-derived hydrocarbon	1,000
Volatile halogenated hydrocarbons	1,000
BTEX	1,000
Polycylic aromatic hydrocarbon (PAH)	1,000
Benzo(a)pyren	50
PCP	5
POP, without PCB, PCDD/PCDF, PBDE und PFOS	50
PCB	50
Tetra-, Penta-, Hexa- und Hepta-BDE (Sum)	1000
PFOS	10
PCDD/PCDF	0,001
Others	
Pesticides	2,500
Artificial mineralfibres	1,000
Cyanides	1,000
Cyklical Amine	1,000

HP criteria, hazardous statements and concentration limits

Hazardous Property		Cut-Off Value	Hazard Statement Code and Concentration Limit	
HP1	Explosive		S	H200, H201, H202, H203, H204, H240, H241
HP2	Oxidising		S	H270, H271, H272
HP3	Flammable		S	H220, H221, H222, H223, H224, H225, H226, H228, H242, H250, H251, H252, H260, H261
HP4	Irritant – skin irritation and eye damage	1 %	Sum	H314 ≥ 1 % (≥ 5% = HP8)
				H318 ≥ 10 %,
				H315 ≥ 20 %
				H319 ≥ 20 %
HP5	Specific Target Organ Toxicity (STOT)/Aspiration Toxicity		S	STOT SE. 1: H370 ≥1 %
				STOT SE. 2: H371 ≥ 10 %
				STOT SE. 3: H335 ≥ 20 %
HP5	Specific Target Organ Toxicity (STOT)/Aspiration Toxicity			STOT RE. 1: H372 ≥1 %
				STOT RE. 2: H373 ≥ 10 %
				Asp. 1: H304[1] : ≥ 10 %
HP6	Acute Toxicity	akut tox. 1-3: 0,1 % akut tox. 4: 1 %	Sum	akut tox. oral 1: H300 ≥ 0,1 %
				akut tox. oral 2: H300 ≥ 0,25 %
				akut tox. oral 3: H301 ≥ 5 %
				akut tox. oral 4: H302 ≥ 25 %
				akut tox. dermal 1: H310 ≥ 0,25%
				akut tox. dermal 2: H310 ≥ 2,5 %
				akut tox. dermal 3: H311 ≥ 15%
				akut tox. dermal 4: H312 ≥ 55 %
				akut tox. inhal 1: H330 ≥ 0,1 %
				akut tox. inhal 2: H330 ≥ 0,5 %
				akut tox. inhal 3: H331 ≥ 3,5 %
				akut tox. inhal 4: H332 ≥22,5 %
HP7	Carcinogenic		S	H350 ≥ 0,1 %, H351 ≥ 1 %
HP8	Corrosive	1 %	Sum	H314 ≥ 5%
HP9	Infectious			
HP10	Toxic for reproduction		S	H360 ≥ 0,3 %, H361 ≥ 3 %
HP11	Mutagenic		S	H340 ≥0,1 %, H341 ≥ 1 %
HP12	Release of an acute toxic gas		S	EUH029, EUH031, EUH032
HP13	Release of an acute toxic gas		S	H317 ≥ 10 %,
				H334 ≥10 %
HP14	Akut aquatic toxicity	H 400, H 410: 0,1%; H 411, H412, H413: 1%	S	H400 ≥ 0,25%
			S	H410 ≥ 0,25%
			S	H411 ≥ 2,5%
			S	H412 ≥ 25%
			S	H413≥ 25%
	can damage the ocone layer	H420: 0,1 %	S	H420: ≥ 0,1%
HP15	Waste capable of exhibiting a hazardous property listed above not directly displayed by the original waste			H205, EUH001, EUH019, EUH044

Sum	sum of all substances
S	one substance
SE	Single Exposure
RE	Repeated Exposure
Draft of the Commission Regulation of Annex III to Directive 2008/98/EG as regards the HP 14	

[1] The kinematic viscosity shall only be determined for fluids. When a waste contains one or more substances classified as Asp. Tox. 1 and the sum of those substances exceeds or equals the concentration limit, the waste shall be classified as hazardous by HP 5 only where the overall kinematic viscosity (at 40 °C) does not exceed 20.5 mm2/s.

Step by Step approach for Assessment of Hazardous Properties in Practise

3. Special Investigations

For metals this system applies only, if the concrete metal compound is unknown.

Otherwise applies the next Table for metal compounds with the concentration values therein laid down:

Step by Step approach for Assessment of Hazardous Properties in Practise

Chemical Assessment and Properties of compounds of metals				HP4			HP5				HP6												HP7		HP8	HP10		HP11		HP13		HP14			
				H314	H318	H315 H319	H370 H372	H371 H373	H304	H335	H300(1)	H300(2)	H301(3)	H302(4)	H310(1)	H310(2)	H311(3)	H312(4)	H330(1)	H330(2)	H331(3)	H332(4)	Kat.1/2 H350	Kat.3 H351	H314	Kat.1/2 H360 H362	Kat.3 H361	Kat.1/2 H340	Kat.3 H341	H317	H334	H400 H410	H411	H412	H413
Blei	C18	Y31	HM		x	x	x	x	x		x	x	x	x	x				x	x	x	x	x	x		x				x		x			
Antimon	C13	Y27	HM																					x									x		
Kupfer	C6 (C)	Y22	HM		x	x								x																		x			
Nickel	C5 (C)		HM		x	x	x						x	x						x	x	x	x	x		x			x	x	x	x		x	x
Selen	C9	Y25	HM				x	x	x			x	x								x		x		x		x			x	x	x	x		x
Zink [P]	C7 (C)	Y23		x	x					x		x		x											x						x	x	x			
Arsen	C8	Y24	HM	x			x					x	x								x		x		x						x		x			
Beryllium	C1	Y20				x	x			x			x							x			x							x			x			
Chrom-VI	C3 (C)	Y21	HM	x	x	x	x			x			x	x			x	x		x		x	x		x	x	x	x	x	x	x	x	x		
Thallium	C17	Y30	HM			x	x	x	x			x	x				x	x		x												x	x		x
Zinn	C12 (C)		HM	x	x	x	x			x		x	x	x	x		x	x		x	x	x		x	x	x	x		x	x		x		x	x
Cadmium	C11	Y26	HM			x	x	x	x	x		x	x	x	x			x		x	x	x	x	x		x	x	x	x			x			x
Quecksilber	C16	Y29	HM	x		x	x	x	x	x		x	x	x	x		x			x	x				x	x	x		x			x			
Tellur	C14	Y28	HM									x	x				x				x	x										x			
Vanadium [P]	C2 (C)				x	x	x	x	x	x				x								x	x				x		x	x			x	x	
Kobalt	C4 (C)						x							x						x			x			x			x	x	x	x			x
Silber	C10 (C)			x																					x							x			
Barium	C15 (C)					x		x	x	x			x	x								x										x	x			
Threshold value		[%]		1	10	20	1	10	10	20	0,1	0,25	5	25	0,25	2,5	15	55	0,1	0,5	3,5	22,5	0,1	1	5	0,3	3	0,1	1	10	10	0,25	2,5	25	0,1
		∑/I		∑	∑	∑	I	I	∑	I	∑	∑	∑	∑	∑	∑	∑	∑	∑	∑	∑	∑	I	I	∑	I	I	I	I	I	I	∑	∑	∑	∑
		[g/kg]		10	100	200	10	100	100	200	1	2,5	50	250	2,5	25	150	550	1	5	35	225	1	10	50	3	30	1	10	100	100	2,5	25	250	1

Specific Components of Specific Waste Types

Metals

Heavy metal means any compound of antimony, arsenic, cadmium, chromium (VI), copper, lead, mercury, nickel, selenium, tellurium, thallium and tin, as well as these materials in metallic form, as far as these are classified as hazardous substances.

Note:

Lead, Copper and Zinc are non hazardous in the metallic form.

Specific Components of Specific Waste Types

Organic Parameters

Mineral Oil Hydrocarbon (MOH)

MOH covers the 10 to 40 Carbon atoms (C10 to C40), MOH with 10 to 22 Carbon atoms (C10 to C22) are mobile hydrocarbons.

- limit value of 0,1 % (1.000 mg/kg) on the single substance for the classification as hazardous

Specific Components of Specific Waste Types

Organic Parameters

Polycyclic Aromatic Hydocarbons (PAH)

Only 16 PAK after EPA (US-Environmenal Protection-Agency) are investigated by chemical analysis.

- limit value of 0,1 % (1.000 mg/kg) on the single substance for the classification to be hazardous
- Benzo[a]pyrene as a marker compound for carcinogenicity for certain coal tar entries (limit value of 0,005 % = 50 mg/kg for classification to be hazardous)

Specific Components of Specific Waste Types

Organic Parameters

PCB

- PCBs include 209 individual substances. Six of the most relevant PCB congeners are used as so-called Ballschmiter congeners in the conventional analysis (PCB-28, -52, -101, -138, -153, -180).
- Wastes with a concentration limit of 0,005 % (50 mg/kg) PCB are PCB-containing wastes.

Specific Components of Specific Waste Types

Organic Parameters

BTEX

- BTEX (acronym for Benzene, Toluene, Ethylbenzene and Xylene) is a group of related volatile organic compounds.
- Benzene as the substance with the highest danger potential is the main parameter with a concentration limit of 0,1 % (1.000 mg/kg), resultant from its carcinogenic effect.

Specific Components of Specific Waste Types

Organic Parameters

Volatile Hydrocarbons (VHC)

Because of the chemical classification of the most of VHCs as specific target organ toxic, acute toxic, carcinogen and ecotoxic (Ocone) the concentration limit for the classification of VHC-containing wastes is 0,1 % (1.000 mg/kg).

Specific Components of Specific Waste Types

Organic Parameters

Persistent Organic pollutions (POPs)

In Annex IV of the EU-Directive 850/2004 a concentration limit of 0,005 % (50 mg/kg) is fixed, from this POP-contained wastes are to be destroyed basically.

Meanwhile, hexachlorobutadiene, polychlorinated naphthalenes, short-chain chlorinated paraffins, endosulfan were included in the EC regulation 850/2004.

For **PBDE** a concentration limit value of **0.1 % (1000 mg/kg**), and **PFOS** of **0.05 % (50 mg/kg)** was set as the limit.

Specific Components of Specific Waste Types

Organic Parameters

Others

- For unknown pesticides, a concentration limit on the chemical classification for ecotoxic of 2,5 % (2.500 mg/kg) is applied.
- For materials containing asbestos in the chemical assessment the the concentration limit is 1.000 mg/kg because of the carcinogenicity.
- For cyanide containing wastes, in particular from metallurgical and galvanic processes and organic synthesis processes, concentration limit of 0,1 % (1.000 mg/kg) is applied.
- For the classification of amine (derivatives of ammonia with alkyl or aryl groups) containing wastes a concentration limit of 0,1 % (1.000 mg/kg) is applied because of the carcinogen properties of certain amines.