French experience of HP 14 Ecotoxic Hazard classification of waste: practical methods including biotests

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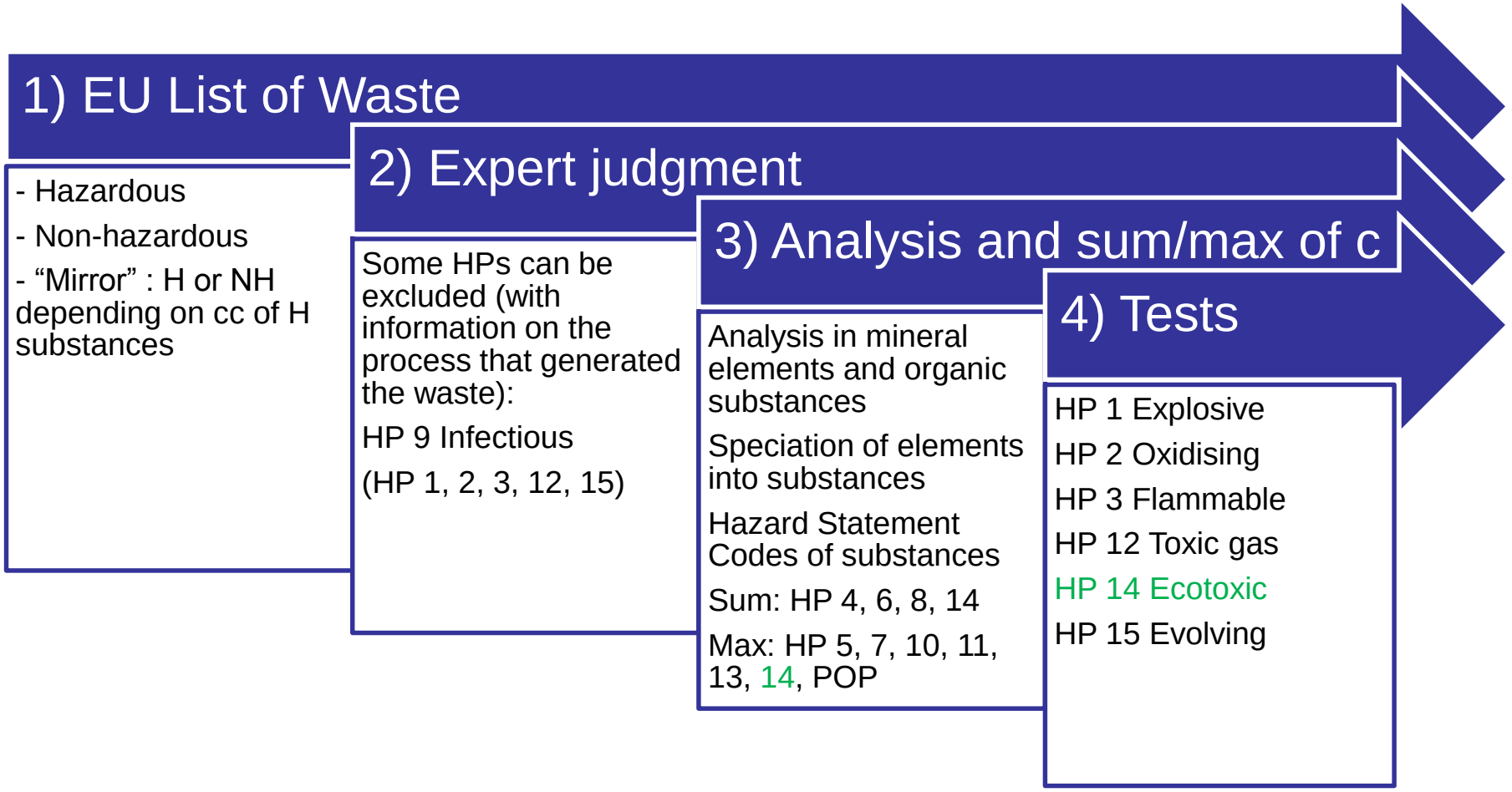
maîtriser le risque pour un développement durable

Tiered approach for waste hazard classification

H?
NH?



H
or
NH

15 Hazard Properties and 1 “Hazardous by POP substances” property: Total 16

The hazard properties of waste (EU 2014, EU 2017) (1/4)

Category and HP	Hazard	Hazard Class and Category codes Hazard Statement Codes	Cut-off values	Methods, classification rules and Concentration Limits
Physical				
HP 1	Explosive	H200, H201, H202, H203, H204, H240, H241	/	Presence or tests (mainly EC A14) or expertise
HP 2	Oxidising	H270, H271, H272	/	Presence or tests (mainly UN 01) or expertise
HP 3	Flammable	H220 à H226, H228, H242, H251, H252, H260, H260	/	Presence or tests (mainly UN N1) or expertise
Health				
HP 4	Irritant (Skin irritation and eye damage)	H314 Skin corr. 1A H318 Eye dam. 1 H315 Skin irrit. 2, H319 Eye irrit. 2	1 %	A: ∑ H314 1A ≥ 1 % B: ∑ H318 ≥ 10 % C: ∑ (H315 et H319) ≥ 20 %
HP 5	Specific target organ toxicity/Aspiration Toxicity	H370 STOT SE 1 H371 STOT SE 2 H335 STOT SE 3 H372 STOT RE 1 H373 STOT RE 2 H304 Asp. Tox. 1	/	A: max (H370) ≥ 1 % B: max (H371) ≥ 10 % C: max (H335) ≥ 20 % D: max (H372) ≥ 1 % E: max (H373) ≥ 10 % F: max (H304) ≥ 10 % G: ∑ H304 ≥ 10 % and global cinematic viscosity fo the waste at 40 °C < 20.5 mm²/s

The hazard properties of waste (EU 2014, EU 2017) (2/4)

Category and HP	Hazard	Hazard Class and Category codes Hazard Statement Codes	Cut-off values	Methods, classification rules and Concentration Limits
HP 6	Acute Toxicity	H300 Acute Tox.1 (Oral) H300 Acute Tox. 2 (Oral H301 Acute Tox. 3 (Oral) H302 Acute Tox 4 (Oral) H310 Acute Tox.1 (Dermal) H310 Acute Tox.2 (Dermal) H311 Acute Tox. 3 (Dermal) H312 Acute Tox 4 (Dermal) H330 Acute Tox 1 (Inhal.) H330 Acute Tox.2 (Inhal.) H331 Acute Tox. 3 (Inhal.) H332 Acute Tox. 4 (Inhal.)	Cat. 1, 2 or 3: 0.1 % Cat. 4: 1 %	A: ∑ H300 1 ≥ 0.1 % B: ∑ H300 2 ≥ 0.25 % C: ∑ H301 ≥ 5 % D: ∑ H302 ≥ 25 % E: ∑ H310 1 ≥ 0.25 % F: ∑ H310 2 ≥ 2.5 % G: ∑ H311 ≥ 15 % H: ∑ H312 ≥ 55 % I: ∑ H330 1 ≥ 0.1 % J: ∑ H330 2 ≥ 0.5 % K: ∑ H331 ≥ 3.5 % L: ∑ H332 ≥ 22.5 %
HP 7	Carcinogenic	H350 Carc. 1A et 1B H351 Carc. 2	/	A: max (H350) ≥ 0.1 % B: max (H351) ≥ 1 %
HP 8	Corrosive	H314 Skin Corr. 1A, 1B et 1C	1 %	A: ∑ H314 ≥ 5 %
HP 9	Infectious		/	Presence of infectious germs code UN 2814 or 2900 or by origin or by expertise (FI, FR, UK)
HP 10	Toxic for reproduction	H360 Repr. 1A et 1B H361 Repr. 2	/	A: max (H360) ≥ 0.3 % B: max (H361) ≥ 3 %

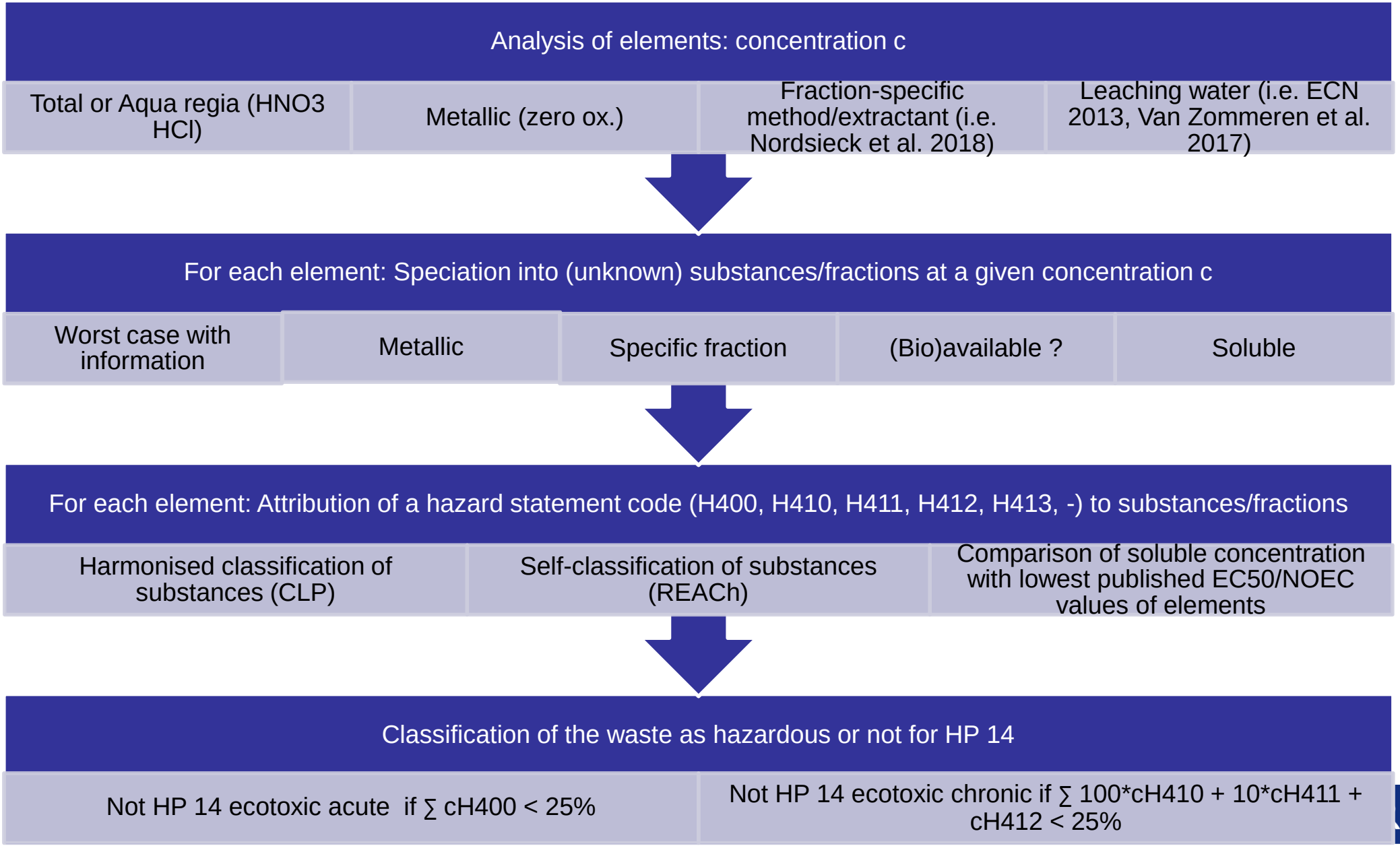
The hazard properties of waste (EU 2014, EU 2017) (3/4)

Category and HP	Hazard	Hazard Class and Category codes Hazard Statement Codes	Cut-off values	Methods, classification rules and Concentration Limits
HP 12	'Release of an acute toxic gas'	EUH029, EUH031, EUH032	/	Presence of these substances by detection of specific gases PH_3, HCN, HF, H_2S, SO_2, HCl et Cl_2 emitted during a test (FR)
HP 11	Mutagenic	H340 Muta. 1A et 1B H341 Muta. 2	/	A: max (H340) ≥ 0.1 % B: max (H341) ≥ 1 %
HP 13	Sensitising	H317, H334	/	A: max (H317) ≥ 10 % B: max(H334) ≥ 10 %
Environment				
HP 14	Ecotoxic	H400, H410, H411, H412, H413	H400, H410: 0.1 % H411, H412, H413: 1 %	A: ∑ H400 ≥ 25 % B: ∑ [(100*H410) + (10*H411) + (H412)] ≥ 25 % C: ∑ (H410 + H411 + H412 + H413) ≥ 25 % D: max (H420) ≥ 0.1 % Or tests (B, D, I, …) with validated CL (FR)
Evolutive				
HP 15	Capable of exhibiting a hazardous property not displayed by the original waste	H205, EUH001, EUH019, EUH044 (explodes if heated or dried or confined)		A property HP 1 to HP 14 may appears by evolution of the waste Or presence of substances with HSC in the third column Or expertise

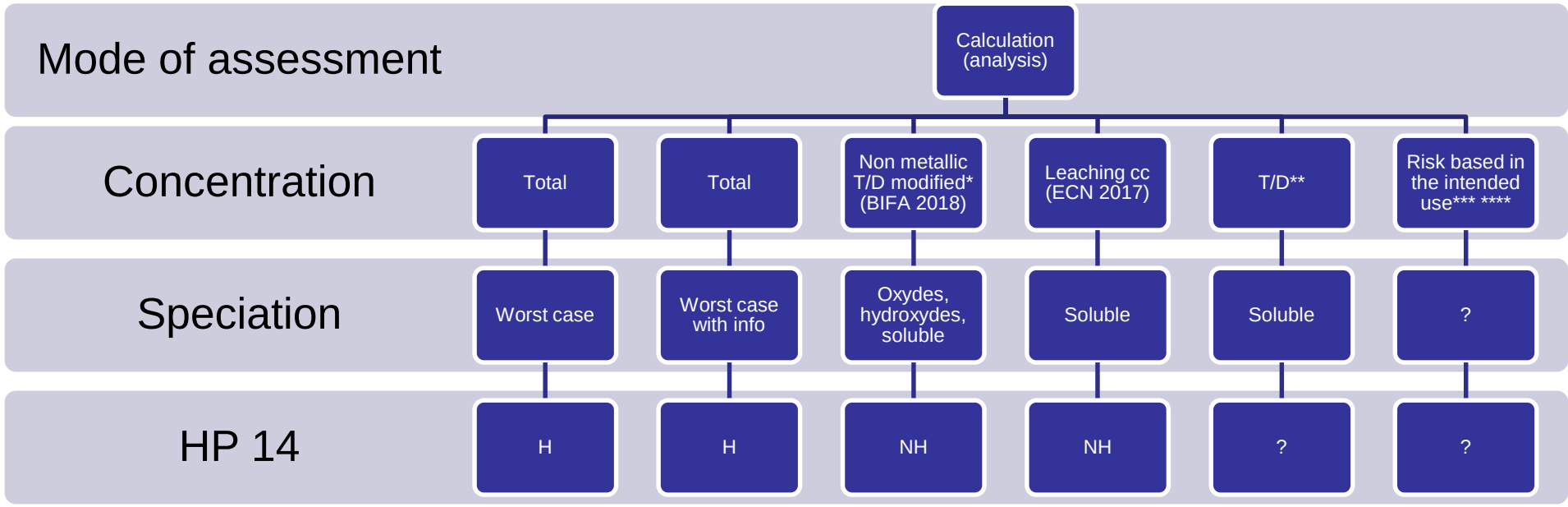
The hazard properties of waste (EU 2014, EU 2017) (4/4)

Category and HP	Hazard	Hazard Class and Category codes Hazard Statement Codes	Cut-off values	Methods, classification rules and Concentration Limits
Health and Environment				
POP	Waste containing one or more POP substances with a concentration > CL	Polychlorinated dibenzo-p-dioxins et dibenzofurans (PCDD/PCDF), DDT (1,1,1-trichloro- 2,2-bis (4-chlorophényl) ethane), chlordane, hexachlorocyclohexanes (including lindane), dieldrin, endrin, heptachlor, hexachlorobenzene, chlordecone, aldrin, pentachlorobenzene, PCB, mirex, toxaphene, hexabromobiphenyl.		PCDD/PCDF: ≥ 15 µg TEQ/kg Others: ≥ 50 mg/kg

Actually many options for HP 14 by calculation…



Example: current propositions for classification of municipal solid waste incinerator bottom ashes (MSWI BA) for HP 14 by calculation…



*mimic TD/p 7 days extraction by extraction with weak acid and strong complexing agent (24 h, pH 4, 2.5 % citric acid + 2.5 % GLDA) (BIFA 2018 = Norsieck at al. 2018)

**assignment of aquatic toxicity class according to the "Transformation/Dissolution protocol" (OECD, UNEP): Assign H410 if the solubility of a substance within 7 days at pH 6 – pH 8 is sufficient to yield toxic effects (c_element > L(E)C50) and if there is no evidence of rapid elimination (BIFA 2018)

***not recommended for hazard assessment (intrinsic property)

****management of hazardous waste by risk mitigation or avoidance practices should be evaluated

Some discrepancies with HP 14 by calculation with and without M-factors…

Waste	Element/substance of concern H410, concentration, M-factor	Status HP 14 before 07/2018 Calculation FR "worst case" or specified	Status HP 14 since 07/2018 Calculation EU "worst case" or specified
		NH if ∑ (10*M*cH410 + 10*cH411 + cH412) < 25%	NH if ∑ (100*cH410 + 10*cH411 + cH412) < 25%
Plastics with Brominated Flame Retardants (BFR) (WEEE, Vehicle, Textiles Equipment, Construction)	Sum tetra-, pentaPBDE HBCDD TBBPA Before sorting 1 – 2 g/kg Sorted Br fraction 4 – 20 g/kg M=1	Before sorting (10*1*0.2%) = 20% < 25% Non hazardous Sorted Br fraction (10*1*2%) = 20% < 25% Non Hazardous	Before sorting (100*0.2%) = 20% < 25% Non Hazardous Sorted Br fraction (100*2%) = 200% > 25% Hazardous
Municipal Solid Waste Incinerator Bottom Ash (MSWI BA)	Cu 4 g/kg Ni 0.5 g/kg Pb 0.5 g/kg Zn 5 g/kg Sum 10 g/kg = 1% M=10	Total c: (10*10*1%) = 100% < 25% Hazardous Leaching c: Non Hazardous	Total c: 100*1% = 100% > 25% Hazardous Complexing at pH 4: sum=19% for 80th percentile (Nordsieck et al 2018): NH Leaching c: NH
Used pesticide packaging	Pesticide 0.2 g/kg M=100…10000	Hazardous	Non Hazardous
Car fluff	2019 ?	?	?

Solutions for speciation of elements into mineral substances: 1/ “generic entries” of the EU harmonised classification for 11 elements

Element	Index No	Chemical international identification	Number of other substances « specified elsewhere »	Hazard Class and Catergory	Hazard Statement Code
As	033-002-00-5	arsenic compounds, with the exception of those specified elsewhere in this Annex. Note 1	4	Acute Tox. 3 * Acute Tox. 3 * Aquatic Acute 1 Aquatic Chronic 1	H331 H301 H400 H410
	033-005-00-1	arsenic acid and its salts with the exception of those specified elsewhere in this Annex.	6	Carc. 1A Acute Tox. 3 * Acute Tox. 3 * Aquatic Acute 1 Aquatic Chronic 1	H350 H331 H301 H400 H410
Ba	056-002-00-7	barium salts, with the exception of barium sulphate, salts of 1-azo-2-hydroxynaphthalenyl aryl sulphonic acid, and of salts specified elsewhere in this Annex	9	Acute Tox. 4 * Acute Tox. 4 *	H332 H302
Be	004-002-00-2	beryllium compounds with the exception of aluminium beryllium silicates, and with those specified elsewhere in this Annex	2	Carc. 1B Acute Tox. 2 * Acute Tox. 3 * STOT RE 1 Eye Irrit. 2 STOT SE 3 Skin Irrit. 2 Skin Sens. 1 Aquatic Chronic 2	H350i H330 Cat2 H301 H372 ** H319 H335 H315 H317 H411

Solutions for speciation of elements into mineral substances: 2/ use cut-off values for HP 14 (concentrations lower not considered)

HP	HP 14.1 Ecotoxic acute	HP 14.2 Ecotoxic chronic	HP 14.3 Ecotoxic chronic	Lowest Concentration Limit (generic entries or worst case with information)	Corresponding HP	Generic entry (no speciation necessary)	Concentration expressed in element (Note 1)	Speciation necessary for HP 14?
Rule	∑ cH400 ≥ 25 %	∑ 100*cH410 + 10*cH411 + cH412 ≥ 25 %	∑ cH410 + cH411 + cH412 + cH413 ≥ 25 %					
Cut-off value	**0.1%**	**0.1%**	**1%**					
Heavy metals								
As	25.00%	0.25%		0.05%	HP 7	Yes	Yes	No
Ba				3.30%	HP 6			No
Cd	25.00%	0.25%		0.05%	HP 7	Yes	Yes	No
Cr VI	6.69%	0.1%		0.03%	HP 7			EN 15192
Cu	6.36%	0.1%		0.1%	HP 14			Yes
Hg	25.00%	0.25%		0.19%	HP 6	Yes	Yes	No
Mo				0.67%	HP 7			No
Ni	9.48%	0.1%		0.04%	HP 7			Yes
Pb	25.00%	0.25%		0.25%	HP 14	Yes	Yes	No
Sb			2.50%	0.84%	HP 7	Yes	Yes	No
Se	17.79%	0.18% Hyp. SeO2	1.14%	0.11%	HP 6	Yes		No
Zn	5.69%	0.1%		0.1%	HP 14			Yes

Details in Hennebert 2018.

Classification of heavy metals for HP 14: some hints, summary

As Ba Cd Hg Mo Pb Sb Se

- Total concentration must be used
- Hazard statement codes by generic entries
- Use concentration of element (Note 1) – do not transform into substance concentration (excepted Se)

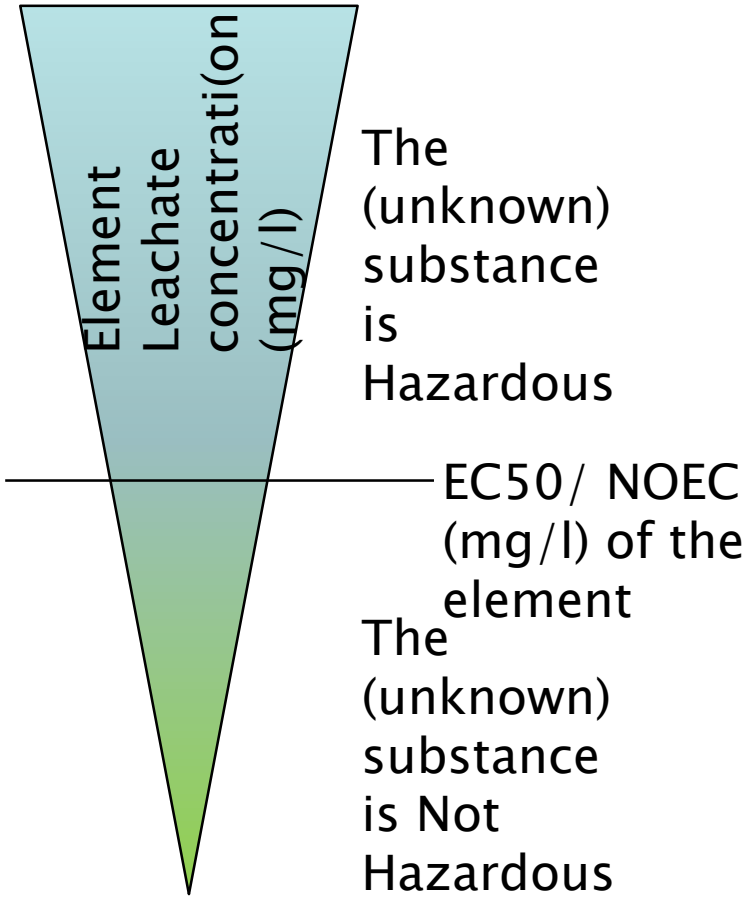
Cr(VI)

- Specific analysis EN 15592 mandatory for fine-tuned classification
- Leachable total Cr is a ± proxy

Cu Ni Zn

- If total concentration > 1 g/kg (0.1%), AND
- If leachable concentration > min EC50 and NOEC of the element,
- → Use “worst case with information” otherwise
- → Either Speciate by an expert team or → Test

Tier 3/ Note: Leachate concentration to assess hazard statement codes of elements for HP 14 (and specially Cu, Ni and Zn)



1. Measure the element concentration in the leachate (LC) (like for landfill acceptance)
2. Compare with minimal EC50 and NOEC of the element (Tables i.e. in Hennebert et al. 2014):

- If LC < EC50 and NOEC, the substance containing that element is not soluble enough to be ecotoxic
- If LC ≥ EC50 or NOEC, the substance containing that element is soluble enough to be ecotoxic:

→ Attribute the H400, H410, H411 statement to that element

Lowest EC50 (concentration of element producing 50% of biological effect) of some elements (INERIS portal, USEPA database)

HP 14 Acute ecotoxicity (M_{acute}, Concentration limit, cut-off value)

Element	Hazard statement code	EC_{50} min (mg element/l)	Substance	*M-factor acute*	Concentration limit acute (mg element/kg)	Cut-off value acute (mg element/kg)
Hg	H400	0.0007	ns	*1 000*	**250 000**	1000
Cd	H400	0.0009	CdCl2	*1 000*	**250 000**	1000
Cu	H400	0.0028	ns	*100*	**250 000**	1000
As	H400	0.0110	AsH2KO4	*10*	**250 000**	1000
Pb	H400	0.0260	Pb(NO3)2	*10*	**250 000**	1000
Cr(VI)	H400	0.0300	K2Cr2O7	*10*	**250 000**	1000
Zn	H400	0.0320	ZnCl2	*10*	**250 000**	1000
Ni	H400	0.0600	NiCl2	*1*	**250 000**	1000
Se	H400	not found		*1*	**250 000**	1000
Tl	-	0.01	ns	-	-	-
U	-	0.04	ns	-	-	-
Be	-	0.1	ns	-	-	-
Sb	-	1.77	SbCl3	-	-	-
Ba	-	14.5	ns	-	-	-
Mo	-	29	ns	-	-	-

(Hennebert et al. 2014, 2016)

Lowest NOEC (no-observed effect concentration of element) of some elements (INERIS portal, USEPA database)

HP 14 Chronic ecotoxicity ($M_{chronic}$, Concentration limit, cut-off value)

Element	Hazard statement code	NOEC min (mg/l)	Substance	*M-factor chronic*	Concentration limit chronic (mg element/kg)	Cut-off value chronic (mg element/kg)
Hg	H410	0.0001	ns	*100*	**2 500**	1000
Cd	H410	0.00016	CdCl2	*100*	**2 500**	1000
U	H411	0.0007	ns	-	**25 000**	10 000
Se	H410	0.0018	Na2SeO3	*10*	**2 500**	1000
Tl	H411	0.0020	ns	-	**25 000**	10 000
Cu	H410	0.0022	CuCl2	*10*	**2 500**	1000
Be	H411	0.0038	ns	-	**25 000**	1000
Cr(VI)	H410	0.0047	K2Cr2O7	*10*	**2 500**	1000
As	H410	0.0050	AsHNa2O4	*10*	**2 500**	1000
Pb	H410	0.0063	ns	*10*	**2 500**	1000
Ni	H410	0.0068	NiCl2	*10*	**2 500**	1000
Zn	H410	0.0100	ZnSO4	*10*	**2 500**	1000
Sb	H411	1.13	SbCl3	-	**25 000**	10 000
Ba	-	2.9	ns	-	-	-
Mo	-	54	ns	-	-	-

(Hennebert et al. 2014, 2016)

Tier 3/ Note: Leachate concentration to assess HP 14

Classification by calculation with leachable concentrations instead of total concentrations

The principle is to calculate the sum of substances using leachable concentrations, rather than total concentrations. Leachable concentrations of metals are typically 1/100 to 1/1000 of the total concentrations.

This method classified 0 samples hazardous from 19 different waste, while the method with M-factors classified 12 samples hazardous (Hennebert et al. 2014).

A similar result has been found by ECN for incinerator bottom ashes (CEWEP 2017): the 95th percentile of a set of bottom ashes was found not ecotoxic based on the leaching concentration, and ecotoxic based on the total content. Furthermore, the leaching concentrations were lower than the cut-off values (CEWEP 2017).

This method is a kind of risk approach and should not be used for (intrinsic) risk assessment:

Hazard * exposure/transfer = Risk

Tier 3/ Note: Bioavailability to assess HP 14 : the only way is to test…

Bioavailability

The assessment of waste should consider the bioavailability of the substances (EU 2017, 2018).

According to ECHA guideline: “In general, there are no specific environmental test methods developed to measure biological availability of substances or mixtures.” (ECHA 2017).

Bioavailability of elements and substances of waste is **not measurable**. The bioavailable fraction is not limited to the leachable fraction: ingestion, inhalation, dermal contact are significant routes of exposure.

→ It seems today that the best method to assess bioavailability is **to use a battery of biotests**.

Tier 4/ Ecotoxicological test battery for HP 14

Tests for HP 14 ‘Ecotoxic’

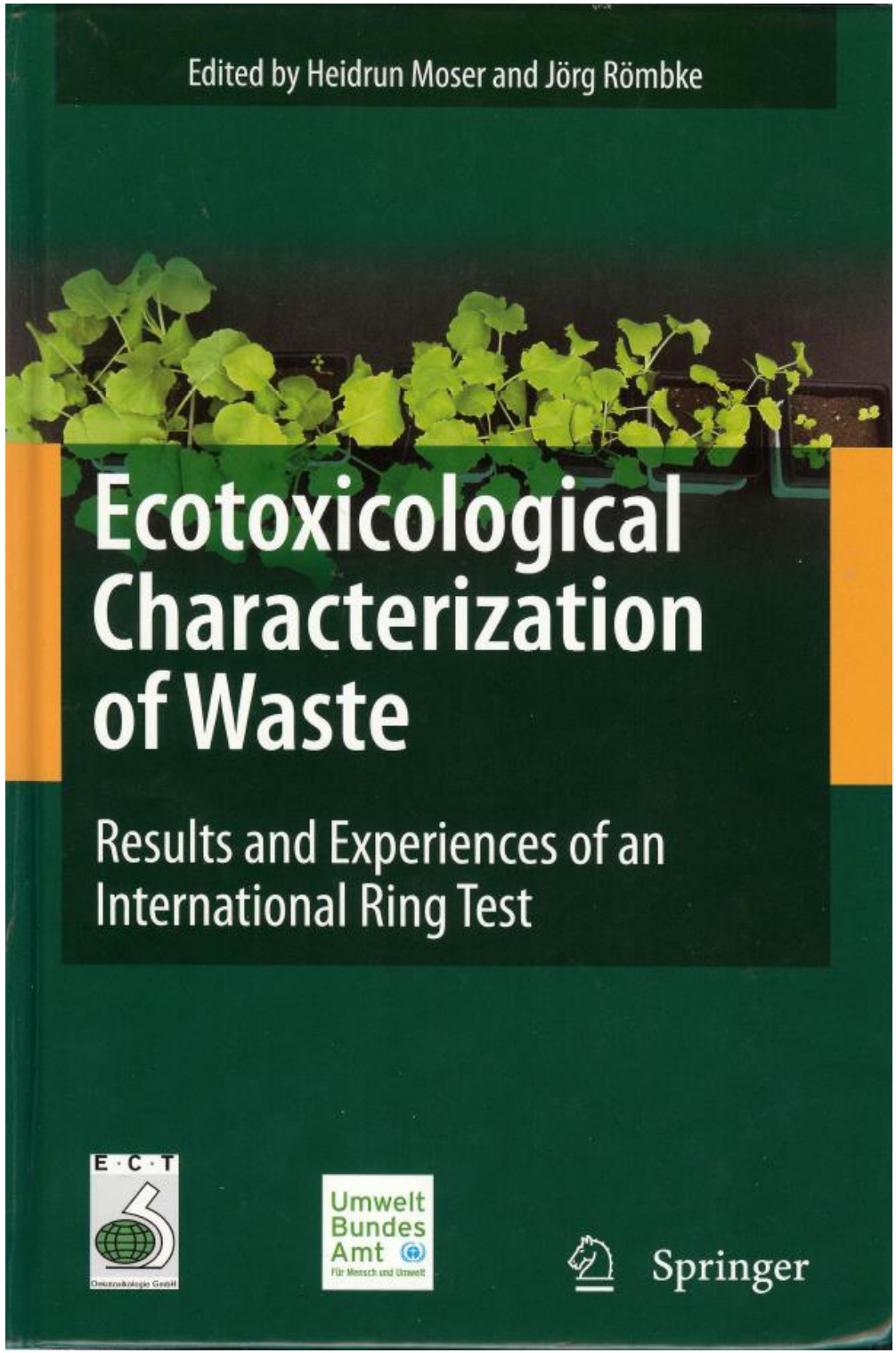
It is recognised that test results prevail on calculation results (EU 2017a, EU 2018), due to not-enough-detailed chemical analysis, unknown antagonist or synergic effects, unknown bioavailability, and so on. *An additional reason is that the actual calculation formula for waste do not use the M-factors.*

No harmonised test battery is available at EU level, after 20 years of propositions (Hennebert 2018). Building on a very large interlaboratory trial in 2006, French and German experts have proposed a test battery (Pandard and Römbke 2013), now without tests options and with validated concentration limits (Hennebert 2018).

Setting “right” concentration limits are more important than modifying tests.

The proposed concentrations limits are simply the highest ecotoxic effect observed in a set of 10 waste non-hazardous by the European List of Waste (taken as the reference) and well-studied from Belgium, France and Germany. They can be improved as more data of H or non-H by EU list (in particular from the Member States of the EU) are available. They have correctly classified 13 hazardous waste by EU list as ecotoxic.

The test can be performed stepwise (the most frequently classifying first) and with the concentration limit only, to reduce costs.



Tier 4/ Ecotoxicological test battery for HP 14: proposition of France (Ministry) and Germany (experts); the important point is the CL

Test	Standard	Expression of results of the test: Concentration of waste generating 50% effect (EC_{50})	Duration	The waste is hazardous if measured EC_{50} < CL
Sample preparation	EN 15002, EN 14735 without pH adjustment			
Aquatic tests (liquid waste or leachate of solid waste)				
1. Inhibition of the light emission of Vibrio fischeri (Luminescent bacteria test)	EN ISO 11348-3 (2007)	Eluate concentration which results in 50% inhibition of light emission (EC_{50})	30 mn	EC_{50} < 15.8% rounded 15%
2. Freshwater algal growth inhibition test with Pseudokirchneriella subcapitata	EN ISO 8692 (2012)	Eluate concentration which results in 50% inhibition of population growth (EC_{50})	72 h	EC_{50} < 7.03% rounded 10%
3. Inhibition of the mobility of Daphnia magna	EN ISO 6341 (2012)	Eluate concentration which results in 50% inhibition of mobility (EC_{50})	48 h	EC_{50} < 7.95% rounded 10%
Terrestrial tests (solid waste)				
4. Soil contact test with Arthrobacter globiformis	ISO 18187 (2014)	Waste concentration which results in 50% inhibition of enzyme activity (EC_{50})	6 h	EC_{50} < 2.25% rounded 5%
5. Effects of chemicals on the emergence and growth of higher plants (Brassica rapa)	EN ISO 11269-2 (2012)	Waste concentration which results in 50% inhibition of growth (EC_{50})	14 d	EC_{50} < 13.7% rounded 15%
6. Avoidance test with earthworms (Eisenia fetida)	ISO 17512-1 (2007)	Waste concentration which affects behavior by 50% (EC_{50})	48 h	EC_{50} < 3.75% rounded 5%

Note on liquid/solid ratio L/S (l/kg during a trial or a time) in waste assessment

Transformation/dissolution protocol of substances: 1, 10 and 100 mg/l, and biotest to measure EC50 and NOEC and attribute Hazard Statement Code (HSC) H400, H410, H411, H412, -. This correspond to L/S 10 000 to 1 000 000 l/kg, corresponding for waste to geological time…

EU leaching tests EN 12457-1 to 4: L/S 2 to 10 l/kg

EU percolation test EN 14405: fractions of 0.1, 0.1, 0.3, 0.5; 1; 3 and 5 l/kg (cumulated: 10 l/kg)

Environmental assessment:

1/ Annual rainfall 800 mm, annual drain 300 mm = 300 l/m²

2/ Landfill for inert waste:

landfilled solid 20 m depth = 20 m^3/m^2 = 30 tonnes/m²

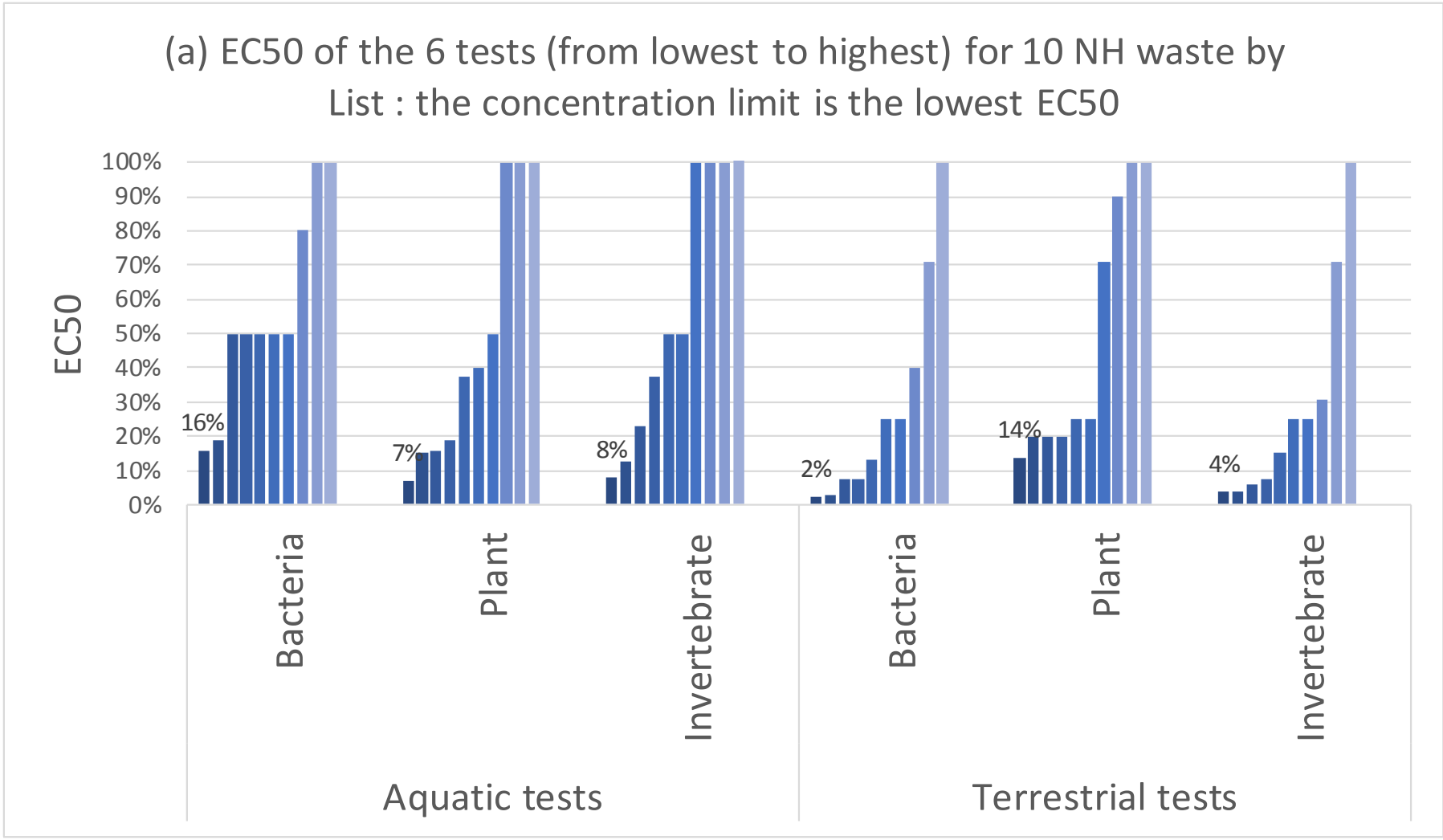
L/S = 300 l / 30 000 kg = 0.01 l/kg every year

3/ Landfill for non hazardous waste: about 0.001 l/kg every year

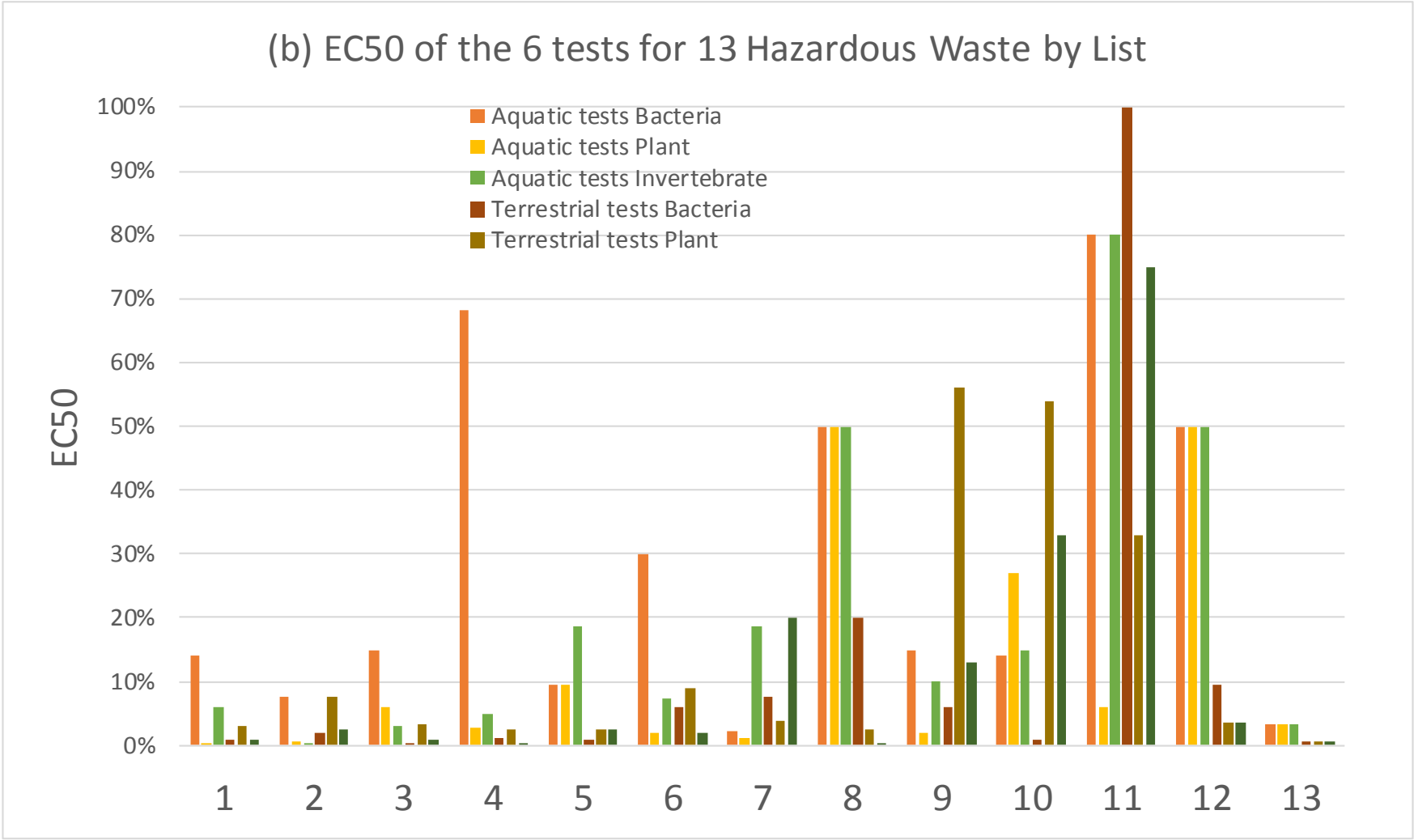
4/ Landfill for hazardous waste: about 0.0001 l/kg every year

5/ Road pavement in good state: drainage 6 mm/year

Tier 4/ Ecotoxicological test battery for HP 14: the CL (concentration limit) is the lowest EC50 (the highest bioresponse) of a set of NH waste

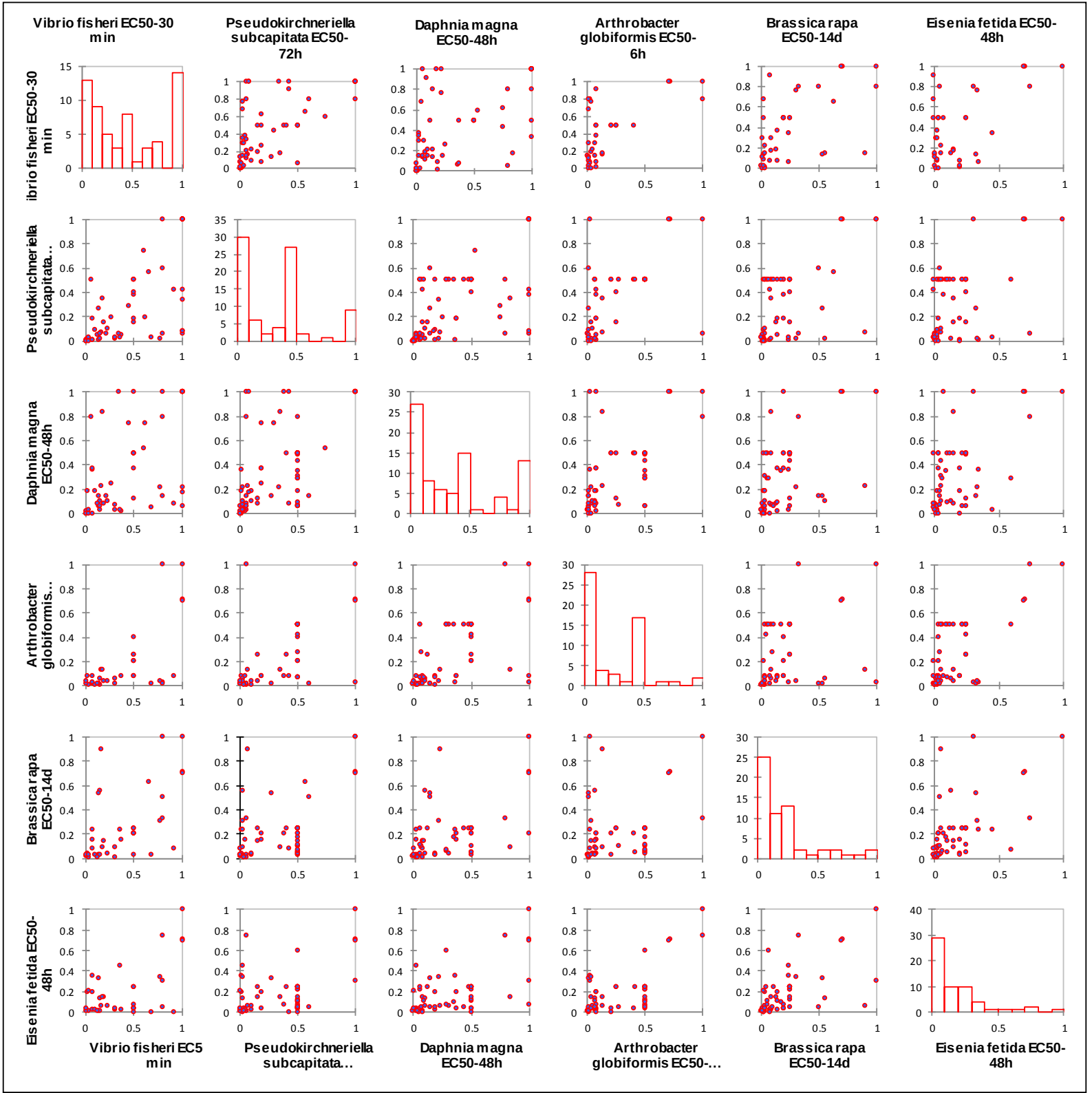


Tier 4/ Ecotoxicological test battery for HP 14 - 13 H waste have always at least one test with a lower EC50 (higher bioresponse)



Graphical correlation matrix of the six tests : not correlated (81 data).

→ The six tests measure different biochemical functions. Not using terrestrial tests reduces the amplitude of the assessment.



Comparison of HP 14 by calculation with and without M-factors, and French-German battery of tests (plus works in progress …)

Waste	Element/substance of concern H410, concentration, M-factor	Status HP 14 before 07/2018 Calculation FR "worst case" or specified	Status HP 14 since 07/2018 Calculation EU "worst case" or specified	Ecotox Test battery – French experience and works in progress
		NH if ∑ (10*M*cH410 + 10*cH411 + cH412) < 25%	NH if ∑ (100*cH410 + 10*cH411 + cH412) < 25%	Leachate : 1 bacteria, 1 algae, 1 invertebrate; Solid : 1 bacteria, 1 plant, 1 invertebrate
Plastics with Brominated Flame Retardants (BFR) (WEEE, Vehicle, Textiles Equipment, Construction)	Sum tetra-, pentaPBDE HBCDD TBBPA Before sorting 1 – 2 g/kg Sorted Br fraction 4 – 20 g/kg M=1	Before sorting (10*1*0.2%) = 20% < 25% Non hazardous Sorted Br fraction (10*1*2%) = 20% < 25% Non Hazardous	Before sorting (100*0.2%) = 20% < 25% Non Hazardous Sorted Br fraction (100*2%) = 200% > 25% Hazardous	Non Hazardous (in progress)
Municipal Solid Waste Incinerator Bottom Ash (MSWI BA)	Cu 4 g/kg Ni 0.5 g/kg Pb 0.5 g/kg Zn 5 g/kg Sum 10 g/kg = 1% M=10	Total c: (10*10*1%) = 100% < 25% Hazardous Leaching c: Non Hazardous	Total c: 100*1% = 100% > 25% Hazardous Complexing at pH 4: sum=19% for 80th percentile (Nordsieck et al 2018): NH Leaching c: NH	Mostly Non Hazardous (Passive or active) carbonation reduces ecotoxicity and is recommended for alkaline waste. Broadening of NH waste set for establishing CL of tests is considered (see below)
Used pesticide packaging	Pesticide 0.2 g/kg M=100…10000	Hazardous	Non Hazardous	Hazardous (in progress)
Car fluff	2019 ?	?	?	?

Comparison of HP 14 by calculation with and without M-factors, and French-German battery of tests: preliminary conclusions

1. **When there is no speciation issue (classification by organic substances that are analysed by the laboratory: BFR, pesticides)**, the classification by the battery is more in line with the classification using the M-factors (plastics with BFR, empty pesticides packaging);

2. **When there is a speciation issue (classification by mineral substances, analysed only in elements by the laboratory)**, the biotests can help to avoid the “always contestable” choice(s) or method(s) of speciation.

   For the particular case of MSWI bottom ashes (17 Mio t/year in EU), frequently used as basement material for roads, and for which calculations with “total” or “worst case with information” concentrations classify as hazardous, tests can be a solution for a more fine-tuned classification.

Laboratories practicing the test battery (limited inquiry 02/2018)

Country	Laboratory	Contact	Tests
Austria	Universität für Bodenkultur Wien - Department IFA-Tulln	ines.fritz@boku.ac.at	(1) (2) (3) others to discuss
Belgium	VITO Environmental Health and Risk	reinhilde.weltens@vito.be	All
Finland	Finnish Environment Institute SYKE	http://www.syke.fi/en-US	(1) (2) (3)
France	EUROFINS	YvesBarthel@eurofins.com	All
	INERIS	pascal.pandard@ineris.fr	All
	Provademse	christine.bazin@insavalor.fr	All
	SGS France	aline.jourdan@sgs.com	All
Germany	ECT Oekotoxikologie GmbH	j-roembke@ect.de	All
	HYDROTOX	gartiser@hydrotox.de	All
Italy	University of Padova - Laboratorio di Ingegneria Sanitaria Ambientale - LISA	alberto.pivato@unipd.it ; mariacristina.lavagnolo@unipd.it	(4) to discuss

Legal status of the test battery in France: recommendend since February 2018, in force in December 2018 in the INERIS Guide

February 2018: Letter of Ministry of Solidary and Ecological Transition to FEDEREC (Federation of Recycling Companies) recommending to use the new test battery

Présentation de la batterie biotests franco-allemande actualisée par ses limites de concentrations par des données françaises 2015/2016 pour la propriété de dangers HP14 "Ecotoxique" des déchets

Principe d'utilisation, coûts, délai

Le principe de la primauté des tests est inscrit dans le droit européen, notamment en cas de doute dans les résultats obtenus par calcul. Les bio-tests permettent de déterminer la dangerosité des déchets complexes

Un certain nombre d'Etats Membres dont la France, ont souhaité et obtenu que ce principe soit rappelé dans la décision réglementaire prise pour définir l'approche harmonisée par calcul.

Unformal diffusion to 80 contacts in EU

Answer of Austria: OK with aquatic tests (because terrestrial tests are not in the CLP classification)

December 2018 (to confirm): Publication in the official classification guide for waste hazardousness (INERIS for MTES). Present version of 2016 with "old" FR test battery (https://www.ineris.fr/sites/ineris.fr/files/contribution/Documents/rapport-drc-15-149793-06416a-guidehp-vf2-1456135314.pdf)

Conclusion: to build concentration limits for biotests at EU level

HP 14 by calculation has two limitations :

- No use of M-factors, impeding a fine tuning of the calculated ecotoxicity;
- Complications for speciation in routine analysis.

Using the harmonised classification of substances, speciation questions can be reduced for heavy metals to 3 mildly ecotoxic elements:

- for Cu, Ni and Zn,
- if total concentration > 1 g/kg (0.1%), AND
- if leachable concentration > min.EC50 and NOEC (> 0.06 mg/l and 0.01 mg/l): 3 options:

→ Use “worst case with information”

→ Speciate the solid phase by an expert team

→ Test

HP 14 by tests with concentration limits in line with the EU list of waste

A battery of 6 uncorrelated biotests without variants and with concentration limits in line with the non hazardous waste of the European List of Waste is proposed.

Setting “right” concentration limits are more important than modifying tests.

Additional data from absolute NH waste (well characterised) can strengthen the proposed concentration limits. This option is considered in France by professional unions.

We invite all the stakeholders to build common EU concentration limits for HP 14 biotests.

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