Committee for Risk Assessment

(RAC)

Opinion

Pursuant to Article 77(3)(c) of Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals

M-factors for long-term aquatic hazard for the copper substances listed in Commission Regulation (EU) 2016/1179

ECHA/RAC/ A77-O-0000001412-86-262/F

Adopted

15 March 2019

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ECHA/RAC/ A77-O-0000001412-86-262/F

OPINION OF THE COMMITTEE FOR RISK ASSESSMENT

ON THE M-FACTORS FOR LONG-TERM AQUATIC HAZARD FOR THE COPPER SUBSTANCES LISTED IN COMMISSION REGULATION (EU) 2016/1179

Pursuant to Article 77(3)(c) of Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (the REACH Regulation), the Committee for Risk Assessment (RAC) has adopted an opinion on the M-factors for long-term aquatic hazard for the copper substances listed in Commission Regulation (EU) 2016/1179.

I PROCESS FOR ADOPTION OF THE OPINION

Following a request from the European Commission on 8 October 2018, the Executive Director of ECHA in the mandate of 12 October 2018[1], requested RAC to prepare an opinion concluding on the M-factors for long-term aquatic hazard for the copper substances listed in Commission Regulation (EU) 2016/1179 within 8 months following receipt of the request.

Rapporteur, appointed by RAC: **Steve Dungey**

Co-rapporteur, appointed by RAC: **Katalin Gruiz**

The draft opinion was made publicly available for targeted public consultation at https://echa.europa.eu/harmonised-classification-and-labelling-previous-targeted-consultations/-/substance-rev/22107/term on 21 January 2019. Concerned parties and Member State Competent Authorities (MSCA) were invited to submit comments and contributions by 4 February 2019.

The RAC opinion was adopted on **15 March 2019**.

The RAC opinion was adopted by consensus of all members present and having the right to vote.

II OPINION OF RAC

RAC opinions for ten copper-containing substances were adopted in December 2014. The ecotoxicologically relevant moiety is the copper (II) cation, which is released from all the copper compounds. The surrogate approach was used for the aquatic chronic classifications at that time due to uncertainties in the completeness of the chronic data set for fish.

The copper ecotoxicity data was subsequently updated for granulated copper and a RAC opinion for that substance was adopted in June 2018. The chronic M-factors for

[1] https://echa.europa.eu/documents/10162/13580/rac_mandate_copper_compounds_m-factors_en.pdf/140120b5-0a92-04f1-728a-a1241cfe1583

the ten copper compounds have therefore been re-assessed using the revised chronic ecotoxicological reference values (ERVs) from the updated dataset.

The chronic M-factor remains the same for six substances, and has been reduced by a factor of 10 for four substances.

The acute M-factor may in certain cases also be affected (see **NOTE** at the end of this opinion), but this was not covered by the current RAC mandate.

III SCIENTIFIC GROUNDS FOR THE OPINION

Based on current assessment approaches, copper (II) ions are not considered to be subject to rapid environmental transformation for the purposes of classification and labelling. This may need to be reviewed once a final agreement is reached about how to address this issue (and similarly, any future revision of the copper metal ERVs may also need to be considered).

The bioaccumulation behaviour of copper (II) ions is complicated by essentiality and homeostatic mechanisms in organisms but does not need to be considered further because it does not influence the determination of the chronic M-factor (in view of the degradability conclusion).

Chronic ERVs for copper (II) cations are presented in the following Table. Further details of the underlying data can be found in the RAC opinion for the classification of granulated copper.

Table. Chronic ERVs for the copper (II) cation (EC_{10}/NOEC) (µg/L)

pH band		
5.51-6.5 (acidic)	**>6.5-7.5 (neutral)**	**>7.5-8.5 (alkaline)**
Values not normalised for DOC level		
13.2 (*Daphnia magna*)	4 (*Ceriodaphnia dubia*)	12.6 (*D. magna*)
Values normalised to a DOC level of 2 mg/L		
10.5 (*D. magna*)	6.2 (*C. dubia*)	11.8 (*C. dubia*)

Copper is a data rich substance but the data aggregation exercise results in some unexpected and potentially misleading trends. This could be an artefact of the varying amounts of data available across the pH bands and between the acute and chronic data sets. There are still potential information gaps for fish which suggest that the chronic ERVs at acidic pH could be lower than 10 µg/L. This is discussed further in the RAC opinion for granulated copper. In the absence of standard studies that have been specifically designed to investigate pH variation under specific DOC and hardness conditions in a single laboratory, the derived ERVs have to be used. The lowest ERV is for neutral conditions (4 or 6.2 µg/L, depending on DOC normalisation).

The impact of these ERVs on the chronic classification of nine of the ten copper compounds is presented in the following Table. These are all considered readily water soluble, so the chronic ERV for each substance has to be calculated from the lowest ERV for the dissolved metal (0.004 mg/L) based on the following formula:

$$\frac{\text{chronic ERV of metal ion} \times \text{molecular weight of the metal compound}}{\text{atomic weight of the metal [63.55]} \times \text{number of metal ions}}$$

The substance-specific ERV is then compared with the CLP criteria in the normal way to set the M-factor (*e.g.* 0.01 < ERV ≤ 0.1 mg/L leads to a chronic M-factor of 1 for a non-rapidly degradable substance).

Table. Revised chronic ERVs and M-factors for nine copper compounds

Substance	Index no.	EC no.	CAS no.	Molecular weight [a]	Number of metal ions	Substance-specific ERV (mg/L) [b]	M-factor
Copper (II) oxide	029-016-00-6	215-269-1	1317-38-0	79.55	1	0.0050	10
Copper (I) oxide	029-002-00-X	215-270-7	1317-39-1	143.1	2	0.0045	10
Copper (II) hydroxide, copper dihydroxide	029-021-00-3	243-815-9	20427-59-2	97.56	1	0.0061	10
Copper (II) carbonate - copper (II) hydroxide (1:1)	029-020-00-8	235-113-6	12069-69-1	221.1	2	0.0070	10
Dicopper chloride trihydroxide	029-017-00-1	215-572-9	1332-65-6	213.6	2	0.0067	10
Copper thiocyanate	029-015-00-0	214-183-1	1111-67-7	121.6	1	0.0077	10
Copper sulphate pentahydrate	029-004-00-0	231-847-6	7758-98-7	249.6	1	0.0157	1
Tetracopper hexahydroxide sulphate [1], tetracopper hexahydroxide sulphate hydrate [2]	029-018-00-7	215-582-3	1333-22-8 [1] 12527-76-3 [2]	461.3	4	0.0073	10
Bordeaux mixture, reaction products of copper sulphate with calcium dihydroxide	029-022-00-9	-	8011-63-0	878.7	4	0.0138	1

Note: a) The same molecular weights have been used as in the original opinions (see comments therein, particularly concerning water of hydration).

b) These are based on the lowest ERV of 4 µg/L (not normalised). If the lowest normalised ERV is used instead (6.2 µg/L), the substance-specific ERV increases by a factor of 1.55. Although this appears trivial, it would in fact reduce the M-factor from 10 to 1 for four of the substances (indicated by orange infill in Table 2), as the substance-specific ERVs would be above 0.01 mg/L. Normalised ERVs may be considered to represent a more refined assessment. Nevertheless, the ECHA opinion for granulated copper noted that the justification to normalise the data to a DOC level of 2 mg/L is weak and not necessarily appropriate (as it is a maximum recommended in the OECD Test Guidelines, which is likely to protect against the toxic effect to some extent). It also introduces some uncertainties due to the omission of studies that lack sufficient background information (which also reduces the size of the data set). In addition, this may not be entirely consistent with the T/Dp data, which are produced in the absence of DOC. Therefore, RAC is not in a position to recommend an appropriate DOC value. The most stringent classification is preferred.

The tenth substance is copper flakes (coated with aliphatic acid) (index no. 029-019-01-X; EC no. -; CAS no. -). This is a form of copper metal, since the aliphatic acid is not chemically bound to the flakes and is not considered to contribute to their ecotoxicity. Consistent with the approach taken in the original opinion, transformation/dissolution protocol (T/Dp) data need to be taken into account. The release of copper ions after 28 days at a notional loading of 0.1 mg/L (extrapolated from a study using a 1 mg/L loading) was 0.077 mg dissolved Cu/L at pH 6 and 0.064 mg dissolved Cu/L at pH 7 (the concentration at a loading of 1 mg/L is ten times higher; further details can be found in the previous RAC opinion). No T/Dp data are available at pH 8. The concentrations at the loading rate of 0.1 mg/L exceed the lowest chronic ERV of the dissolved form at the same pH (see the following Table), confirming classification as Aquatic Chronic 1 for a non-rapidly degradable substance.

The CLP guidance (Annex IV.5.4, version 5.0) recommends that the M-factor is obtained from the following ratio:

$$\frac{\textit{Soluble metal ion concentration at a loading of 1 mg/L from a 28-d T/Dp test}}{\textit{Chronic ERV}}$$

A ratio between 10 and 100 leads to an M-factor of 10, etc.

Since the dissolved metal concentration is higher at acidic pH but the chronic ERV is lowest at neutral pH, RAC has considered both pH bands. The ratio using the normalised and non-normalised ERVs, respectively, is 74 or 58 at acidic pH and 160 or 103 at neutral pH. This indicates a worst case chronic M-factor of 100 at neutral pH (as the ratio is in the range 100-1000), which appears counter-intuitive compared to the soluble copper compounds (which have chronic M-factors of either 1 or 10).

However, if the soluble ion concentration at the loading relevant for Aquatic Chronic 1 classification is used instead, the ratio becomes 7 or 6 (acidic pH) and 16 or 10 (neutral pH). This indicates a worst case chronic M-factor of 10 at neutral pH (as the ratio is in the range 10-100). This approach is provided in a classification example in the metals annex of the CLP guidance (example B), and was used in the previous RAC opinion for this substance. RAC supports this approach and recommends that the guidance is clarified to remove this inconsistency.

These data are summarised in the following Table.

Table. Chronic M-factor for copper flakes at acidic and neutral pH

pH band	Soluble metal ion concentration from 28-d T/Dp test, µg/L	Chronic ERV, µg/L	Ratio	Chronic M-factor
T/Dp loading of 1 mg/L				
Acid	773	10.5 or 13.2	74 or 58	10
Neutral	639	4 or 6.2	160 or 103	100
T/Dp loading of 0.1 mg/L				
Acid	77	10.5 or 13.2	7 or 6	1
Neutral	64	4 or 6.2	16 or 10	10

Public consultation comments: Two sets of comments were received. Industry made five requests:

- to consider normalised ERVs, since these affect the M-factor for four of the copper compounds;
- to remove the inconsistency in the CLP Guidance about the use of loading rate in the M-factor derivation (as already highlighted in the original draft opinion), expressing a preference for the loading rate of 0.1 mg/L;
- to delete the CAS and EC numbers for copper (in relation to copper flakes), to be consistent with the 9th ATP to the CLP Regulation;
- to acknowledge that resolution of the rapid removal concept for metals would lead to a review for these substances; and to acknowledge that acute M-factors also need to be reviewed.

One Member State Competent Authority (MSCA) asked for some further explanation of the derivation of the M-factors to be added for the nine soluble copper compounds, and expressed a preference for a loading rate of 0.1 mg/L in the derivation of the M-factor for copper flakes.

The opinion now reflects all of these points.

RAC opinion: RAC considers that the following chronic M-factors are appropriate:

Copper (II) oxide	10	[lower than previous opinion]
Copper (I) oxide	10	[lower than previous opinion]
Copper (II) hydroxide, copper dihydroxide	10	[no change]
Copper (II) carbonate - copper (II) hydroxide (1:1)	10	[no change]
Dicopper chloride trihydroxide	10	[no change]
Copper thiocyanate	10	[no change]
Copper sulphate pentahydrate	1	[lower than previous opinion]
Tetracopper hexahydroxide sulphate [& hydrate]	10	[no change]
Bordeaux mixture	1	[lower than previous opinion]
Copper flakes (coated with aliphatic acid)	10	[no change]

N.B. Classification of metals may distinguish between massive and powder forms under some circumstances, but further sub-divisions are not anticipated. This issue also arose during the RAC discussion of granulated copper in 2018. Since this is a policy rather than a scientific issue, RAC is not in a position to comment further.

NOTE

This RAC mandate included the re-assessment of the chronic **but not the acute** M-factors for the ten copper compounds listed in Commission Regulation (EU) 2016/1179. However, the RAC opinion on granulated copper also includes revised acute ecotoxicity reference values (ERVs), which are slightly different from those derived in 2014 for the same copper compounds. These new values could impact the acute M-factor(s) for some of the substances: specifically, Copper (II) oxide and Copper (I) oxide could both obtain acute M-factors of 10 instead of 100, as presented in the following table.

Table: Updated acute ERVs and potential impact on acute M-factors following re-calculation (changes in bold)

Substance (listed in Commission Regulation (EU) 2016/1179	**Substance specific acute ERVs (corrected for molecular weight)**			**acute M-factors**		
	current	**updated***	**updated****	**current**	**updated ***	**updated****
Copper(II)oxide	0,0101	0,0151	0,0138	**100**	**10**	**10**
Copper (I) oxide	0,0091	0,0136	0,0124	**100**	**10**	**10**
Copper (II) hydroxide, copper dihydroxide	0,0124	0,0186	0,0169	10	10	10
Copper(II) carbonate – copper (II) hydroxide (1:1)	0,0141	0,0210	0,0191	10	10	10
Dicopper chloride trihydroxide	0,0136	0,0203	0,0185	10	10	10
Copper thiocyanate	0,0155	0,0232	0,0210	10	10	10
Copper sulphate (pentahydrate)	0,0318	0,0475	0,0432	10	10	10
Tetracopper hexahydroxide sulphate [1],	0,0147	0,0220	0,0200	10	10	10

tetracopper hexahydroxide sulphate hydrate [2]						
Bordeaux mixture	0,0280	0,0418	0,0380	10	10	10
Copper flakes (coated with aliphatic acid)	0,0081	0,0121	0,011	10	10	10

* not normalised for DOC LC_{50} of 12.1 µg/L for *P. promelas* at acidic pH. The RAC opinion on granulated copper reports an LC_{50} of 11.7 µg/L for *D. rerio* (at neutral pH) as the lowest value. However, this value was derived in very soft water test medium which makes it difficult to compare sensitivities between species, and RAC considered that it is not relevant to use data for hazard classification purposes which were obtained at hardness levels outside of the recommended range in the OECD TG. Therefore the lowest value derived at acidic pH (LC_{50} of 12.1 µ/L for *P. promelas*) has been used for calculating the acute ERV. It should be noted that both values result in the same acute M-factor.
Further details of the underlying data can be found in the RAC opinion for the classification of granulated copper.
** DOC normalised EC_{50} of 11.0 µg/L for *D. magna*

In the view of RAC, a change of acute M-factor(s) is in principle justified and therefore this recommendation by RAC on the potential impact of the revised acute ERVs on the acute M-factors is included to the opinion for future Commission consideration.

ANNEX 1

C&L tables of previously agreed copper substances.

1. **Copper flakes (coated with aliphatic acid)**
2. **Copper (II) oxide**
3. **Copper (I) oxide**
4. **Copper (II) hydroxide, copper dihydroxide**
5. **Copper (II) carbonate -- copper (II) hydroxide (1:1)**
6. **Dicopper chloride trihydroxide**
7. **Copper thiocyanate**
8. **Copper sulphate pentahydrate**
9. **Tetracopper hexahydroxide sulphate [1], tetracopper hexahydroxide sulphate hydrate [2]**
10. **Bordeaux mixture, reaction products of copper sulphate with calcium dihydroxide**

1. Copper flakes (coated with aliphatic acid)

RAC adopted the opinion on the M-factor for long-term aquatic hazard for **Copper flakes (coated with aliphatic acid)** as follows:

Classification and labelling in accordance with the CLP Regulation (Regulation (EC) 1272/2008)

	Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling			Specific Conc. Limits, M-factors	Notes
					Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram, Signal Word Code(s)	Hazard state-ment Code(s)	Suppl. Hazard statement Code(s)		
Current Annex VI entry	029-019-01-X	copper flakes (coated with aliphatic acid)	-	-	Acute Tox. 3 Acute Tox. 4 Eye Irrit. 2 Aquatic Acute 1 Aquatic Chronic 1	H331 H302 H319 H400 H410	GHS06 GHS09 Dgr	H331 H302 H319 H410		M=10	
RAC opinion	029-019-01-X	copper flakes (coated with aliphatic acid)	-	-	**Retain:** Acute Tox. 3 Acute Tox. 4 Eye Irrit. 2 Aquatic Acute 1 Aquatic Chronic 1	**Retain:** H331 H302 H319 H400 H410	**Retain:** GHS06 GHS09 Dgr	**Retain:** H331 H302 H319 H410		**Retain:** M=10 **Add:** M=10	
Resulting Annex VI entry if agreed by COM	029-019-01-X	copper flakes (coated with aliphatic acid)	-	-	Acute Tox. 3 Acute Tox. 4 Eye Irrit. 2 Aquatic Acute 1 Aquatic Chronic 1	H331 H302 H319 H400 H410	GHS06 GHS09 Dgr	H331 H302 H319 H410		M=10 M=10	

2. Copper(II) oxide

RAC adopted the opinion on the M-factor for long-term aquatic hazard for **Copper(II) oxide** as follows:

Classification and labelling in accordance with the CLP Regulation (Regulation (EC) 1272/2008)

	Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling			Specific Conc. Limits, M-factors	Notes
					Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram, Signal Word Code(s)	Hazard state-ment Code(s)	Suppl. Hazard statement Code(s)		
Current Annex VI entry	029-016-00-6	copper(II) oxide	215-269-1	1317-38-0	Aquatic Acute 1 Aquatic Chronic 1	H400 H410	GHS09 Wng	H410		M=100	
RAC opinion	029-016-00-6	copper(II) oxide	215-269-1	1317-38-0	**Retain:** Aquatic Acute 1 Aquatic Chronic 1	**Retain:** H400 H410	**Retain:** GHS09 Wng	**Retain:** H410		**Retain:** M=100 **Add:** M=10	
Resulting Annex VI entry if agreed by COM	029-016-00-6	copper(II) oxide	215-269-1	1317-38-0	Aquatic Acute 1 Aquatic Chronic 1	H400 H410	GHS09 Wng	H410		M=100 M=10	

3. dicopper oxide;copper (I) oxide (Cu_2O)

RAC adopted the opinion on the M-factor for long-term aquatic hazard for **dicopper oxide;copper (I) oxide (Cu_2O)** as follows:

Classification and labelling in accordance with the CLP Regulation (Regulation (EC) 1272/2008)

	Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling			Specific Conc. Limits, M-factors	Notes
					Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram, Signal Word Code(s)	Hazard state-ment Code(s)	Suppl. Hazard statement Code(s)		
Current Annex VI entry	029-002-00-X	dicopper oxide; copper (I) oxide;	215-270-7	1317-39-1	Acute Tox 4 Acute Tox. 4 Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	H332 H302 H318 H400 H410	GHS07 GHS05 GHS09 Dgr	H332 H302 H318 H410		M=100	
RAC opinion	029-002-00-X	dicopper oxide; copper (I) oxide;	215-270-7	1317-39-1	**Retain:** Acute Tox. 4 Acute Tox. 4 Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	**Retain:** H332 H318 H400 H410	**Retain:** Dng GHS05 GHS09	**Retain:** H332 H302 H318 H410		**Retain:** M=100 **Add:** M=10	
Resulting Annex VI entry if agreed by COM	029-002-00-X	dicopper oxide; copper (I) oxide;	215-270-7	1317-39-1	Acute Tox 4 Acute Tox. 4 Eye Dam.1 Aquatic Acute 1 Aquatic Chronic 1	H332 H302 H318 H400 H410	GHS05 GHS07 GHS09 Dng	H332 H302 H318 H410		M=100 M=10	

4. Copper dihydroxide; copper(II) hydroxide

RAC adopted the opinion on the M-factor for long-term aquatic hazard for **copper dihydroxide; copper(II) hydroxide** as follows:

Classification and labelling in accordance with the CLP Regulation (Regulation (EC) 1272/2008)

	Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling			Specific Conc. Limits, M-factors	Notes
					Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram, Signal Word Code(s)	Hazard state-ment Code(s)	Suppl. Hazard statement Code(s)		
Current Annex VI entry	029-021-00-3	copper dihydroxide; copper(II) hydroxide	243-815-9	20427-59-2	Acute Tox. 2 Acute Tox. 4 Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	H330 H302 H318 H400 H410	GHS06 GHS05 GHS09 Dgr	H330 H302 H318 H410		M=10	
RAC opinion	029-021-00-3	copper dihydroxide; copper(II) hydroxide	243-815-9	20427-59-2	**Retain:** Acute Tox. 2 Acute Tox. 4 Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	**Retain:** H330 H302 H318 H400 H410	**Retain:** GHS06 GHS05 GHS09 Dgr	**Retain:** H330 H302 H318 H410		**Retain:** M=10 **Add:** M=10	
Resulting Annex VI entry if agreed by COM	029-021-00-3	copper dihydroxide; copper(II) hydroxide	243-815-9	20427-59-2	Acute Tox. 2 Acute Tox. 4 Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	H330 H302 H318 H400 H410	GHS06 GHS05 GHS09 Dgr	H330 H302 H318 H410		M=10 M=10	

5. copper(II) carbonate--copper(II) hydroxide (1:1)

RAC adopted the opinion on the M-factor for long-term aquatic hazard for **copper(II) carbonate--copper(II) hydroxide (1:1)** as follows:

Classification and labelling in accordance with the CLP Regulation (Regulation (EC) 1272/2008)

	Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling			Specific Conc. Limits, M-factors	Notes
					Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram, Signal Word Code(s)	Hazard state-ment Code(s)	Suppl. Hazard statement Code(s)		
Current Annex VI entry	029-020-00-8	copper(II) carbonate--copper(II) hydroxide (1:1)	235-113-6	12069-69-1	Acute Tox. 4 Acute Tox. 4 Eye Irrit. 2 Aquatic Acute 1 Aquatic Chronic 1	H332 H302 H319 H400 H410	GHS07 GHS09 Wng	H332 H302 H319 H410		M=10	
RAC opinion	029-020-00-8	copper(II) carbonate--copper(II) hydroxide (1:1)	235-113-6	12069-69-1	**Retain:** Acute Tox. 4 Acute Tox. 4 Eye Irrit. 2 Aquatic Acute 1 Aquatic Chronic 1	**Retain:** H332 H302 H319 H400 H410	**Retain:** GHS07 GHS09 Wng	**Retain:** H332 H302 H319 H410		**Retain:** M=10 **Add:** M=10	
Resulting Annex VI entry if agreed by COM	029-020-00-8	copper(II) carbonate--copper(II) hydroxide (1:1)	235-113-6	12069-69-1	Acute Tox. 4 Acute Tox. 4 Eye Irrit. 2 Aquatic Acute 1 Aquatic Chronic 1	H332 H302 H319 H400 H410	GHS07 GHS09 Wng	H332 H302 H319 H410		M=10 M=10	

6. Dicopper chloride trihydroxide

RAC adopted the opinion on the M-factor for long-term aquatic hazard for **Dicopper chloride trihydroxide** as follows:

Classification and labelling in accordance with the CLP Regulation (Regulation (EC) 1272/2008)

	Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling			Specific Conc. Limits, M-factors	Notes
					Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram, Signal Word Code(s)	Hazard state-ment Code(s)	Suppl. Hazard statement Code(s)		
Current Annex VI entry	029-017-00-1	dicopper chloride trihydroxide	215-572-9	1332-65-6	Acute Tox. 3 Acute Tox. 4 Aquatic Acute 1 Aquatic Chronic 1	H301 H332 H400 H410	GHS06 GHS09 Dgr	H332 H301 H410		M = 10	
RAC opinion	029-017-00-1	dicopper chloride trihydroxide	215-572-9	1332-65-6	**Retain:** Acute Tox. 3 Acute Tox. 4 Aquatic Acute 1 Aquatic Chronic 1	**Retain:** H301 H332 H400 H410	**Retain:** GHS06 GHS09 Dgr	**Retain:** H301 H332 H410		**Retain:** M=10 **Add:** M=10	
Resulting Annex VI entry if agreed by COM	029-017-00-1	dicopper chloride trihydroxide	215-572-9	1332-65-6	Acute Tox. 3 Acute Tox. 4 Aquatic Acute 1 Aquatic Chronic 1	H301 H332 H400 H410	GHS06 GHS09 Dgr	H301 H332 H410		M=10 M=10	

7. Copper thiocyanate

The RAC adopted the opinion on the M-factor for long-term aquatic hazard for **Copper thiocyanate** as follows:

Classification and labelling in accordance with the CLP Regulation (Regulation (EC) 1272/2008)

	Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling			Specific Conc. Limits, M-factors	Notes
					Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram, Signal Word Code(s)	Hazard state-ment Code(s)	Suppl. Hazard statement Code(s)		
Current Annex VI entry	615-004-00-3	salts of thiocyanic acid, with the exception of those specified elsewhere in this Annex	214-183-1	1111-67-7	Aquatic Acute 1 Aquatic Chronic 1	H400 H410	GHS09 Wng	H410	EUH032	M=10	
RAC opinion	029-015-00-0	copper thiocyanate	214-183-1	1111-67-7	**Retain:** Aquatic Acute 1 Aquatic Chronic 1	**Retain:** H400 H410	**Retain:** GHS09 Wng	**Retain:** H410	EUH032	**Retain:** M=10 **Add:** M=10	
Resulting Annex VI entry if agreed by COM	029-015-00-0	copper thiocyanate	214-183-1	1111-67-7	Aquatic Acute 1 Aquatic Chronic 1	H400 H410	GHS09 Wng	H410	EUH032	M=10 M=10	

8. Copper sulphate pentahydrate

RAC adopted the opinion on the M-factor for long-term aquatic hazard for **copper sulphate pentahydrate** as follows:

Classification and labelling in accordance with the CLP Regulation (Regulation (EC) 1272/2008)

	Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling			Specific Conc. Limits, M-factors	Notes
					Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram, Signal Word Code(s)	Hazard state-ment Code(s)	Suppl. Hazard statement Code(s)		
Current Annex VI entry	029-004-00-0	Copper sulphate pentahydrate	231-847-6	7758-99-8	Acute Tox. 4 Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	H302 H318 H400 H410	GHS07 GHS05 GHS09 Dgr	H302 H318 H410		M = 10	
RAC opinion	029-004-00-0	Copper sulphate pentahydrate	231-847-6	7758-99-8	**Retain:** Acute Tox. 4 Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	**Retain:** H302 H318 H400 H410	**Retain:** GHS07 GHS05 GHS09 Dgr	**Retain:** H302 H318 H410		**Retain:** M=10 **Add:** M=1	
Resulting Annex VI entry if agreed by COM	029-004-00-0	Copper sulphate pentahydrate	231-847-6	7758-99-8	Acute Tox. 4 Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	H302 H318 H400 H410	GHS07 GHS05 GHS09 Dgr	H302 H318 H410		M=10 M=1	

9. Tetracopper hexahydroxide sulphate [1], tetracopper hexahydroxide sulphate hydrate [2]

The RAC adopted the opinion on the M-factor for long-term aquatic hazard for **Tetracopper hexahydroxide sulphate and Tetracopper hexahydroxide sulphate hydrate** as follows:

Classification and labelling in accordance with the CLP Regulation (Regulation (EC) 1272/2008)

	Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling			Specific Conc. Limits, M-factors	Notes
					Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram, Signal Word Code(s)	Hazard state-ment Code(s)	Suppl. Hazard statement Code(s)		
Current Annex VI entry	029-018-00-7	Tetracopper hexahydroxide sulphate [1] Tetracopper hexahydroxide sulphate hydrate [2]	215-582-3	1333-22-8 [1] 12527-76-3 [2]	Acute Tox. 4 Aquatic Acute 1 Aquatic Chronic 1	H302 H400 H410	GHS07 GHS09 Wng	H302 H410		M=10	
RAC opinion	029-018-00-7	Tetracopper hexahydroxide sulphate [1] Tetracopper hexahydroxide sulphate hydrate [2]	215-582-3	1333-22-8 [1] 12527-76-3 [2]	**Retain:** Acute Tox. 4 Aquatic Acute 1 Aquatic Chronic 1	**Retain:** H302 H400 H410	**Retain:** GHS07 GHS09 Wng	**Retain:** H302 H410		**Retain:** M=10 **Add:** M=10	
Resulting Annex VI entry if agreed by COM	029-018-00-7	Tetracopper hexahydroxide sulphate [1] Tetracopper hexahydroxide sulphate hydrate [2]	215-582-3	1333-22-8 [1] 12527-76-3 [2]	Acute Tox. 4 Aquatic Acute 1 Aquatic Chronic 1	H302 H400 H410	GHS07 GHS09 Wng	H302 H410		M=10 M=10	

10. Bordeaux mixture; Reaction products of copper sulphate with calcium dihydroxide

RAC adopted the opinion on the M-factor for long-term aquatic hazard for **Bordeaux mixture; Reaction products of copper sulphate with calcium dihydroxide** as follows:

Classification and labelling in accordance with the CLP Regulation (Regulation (EC) 1272/2008)

	Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling			Specific Conc. Limits, M-factors	Notes
					Hazard Class and Category Code(s)	Hazard statement Code(s)	Pictogram, Signal Word Code(s)	Hazard state-ment Code(s)	Suppl. Hazard statement Code(s)		
Current Annex VI entry	029-022-00-9	Bordeaux mixture; Reaction products of copper sulphate with calcium dihydroxide	-	8011-63-0	Acute Tox. 4 Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	H332 H318 H400 H410	GHS07 GHS05 GHS09 Dgr	H332 H318 H410		M=10	
RAC opinion	029-022-00-9	Bordeaux mixture; Reaction products of copper sulphate with calcium dihydroxide	-	8011-63-0	**Retain:** Acute Tox. 4 Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	**Retain:** H332 H318 H400 H410	**Retain:** GHS07 GHS05 GHS09 Dgr	**Retain:** H332 H318 H410		**Retain:** M=10 **Add:** M=1	
Resulting Annex VI entry if agreed by COM	029-022-00-9	Bordeaux mixture; Reaction products of copper sulphate with calcium dihydroxide	-	8011-63-0	Acute Tox. 4 Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	H332 H318 H400 H410	GHS07 GHS05 GHS09 Dgr	H332 H318 H410		M=10 M=1	