Substance name: Chromium trioxide
EC number: 215-607-8
CAS number: 1333-82-0

MEMBER STATE COMMITTEE SUPPORT DOCUMENT FOR IDENTIFICATION OF

CHROMIUM TRIOXIDE

AS A SUBSTANCE OF VERY HIGH CONCERN BECAUSE OF ITS CMR PROPERTIES

Adopted on 2 December 2010

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Substance Name: Chromium trioxide

EC Number: 215-607-8

CAS number: 1333-82-0

- *Chromium trioxide* is identified as substance meeting the criteria of Article 57(a) of Regulation (EC) 1907/2006 (REACH) owing to its classification in the hazard class carcinogenicity category 1A[1] under Annex VI, part 3, Table 3.1 of Regulation (EC) No 1272/2008, as well as its corresponding classification under Annex VI, part 3, Table 3.2 as carcinogen category 1[2].
- *Chromium trioxide* is identified as a substance meeting the criteria of Article 57(b) of Regulation (EC) 1907/2006 (REACH) owing to its classification in the hazard class mutagenicity category 1B[1] under Annex VI, part 3, Table 3.1 of Regulation (EC) No 1272/2008, as well as its corresponding classification under Annex VI, part 3, Table 3.2 as mutagen category 2[2].

Summary of how the substance meets the Carcinogen 1A and Mutagen 1B criteria

Prior to 1 December 2010 Articles 57 (a) and (b) of REACH required that substances may be included in Annex XIV if they meet the criteria for classification as (a) carcinogenic category 1 or 2 and (b) mutagenicity category 1 or 2, in accordance with Directive 67/548/EEC.

As of 1 December 2010 Articles 57(a) and (b) of REACH have been amended by Regulation (EC) No 1272/2008 in so far as they provide that substances may be included in Annex XIV where the substances meet the criteria for classification in (a) the hazard class carcinogenicity category 1A or 1B in accordance with section 3.6 of Annex I to Regulation (EC) no. 1272/2008 and (b) the hazard class mutagenicity category 1A or 1B, (germ cell mutagenicity) in accordance with section 3.5 of Annex I to Regulation (EC) No 1272/2008.

The original Annex XV dossier of Germany for Chromium trioxide was submitted before 1 December 2010 and therefore proposed that the substance is identified as meeting the criteria under Article 57(a) and (b) of the version of REACH existing at that time, i.e., the substance meets the criteria for classification as carcinogen category 1 and mutagen category 2 set out under Directive 67/548/EEC.

However, as the agreement of the Member State Committee in relation to the identification has been taken after 1 December 2010, this agreement is based on the criteria set out in the amended Article 57. It should however be noted that the amendment of Article 57 was not sufficient to reopen the public consultation on the identification of this substance given that the harmonised classification

[1] Classification in accordance with Regulation (EC) No 1272/2008 Annex VI Table 3.1 List of harmonised classification and labelling of hazardous substances

[2] Classification in accordance with Regulation (EC) No 1272/2008 Annex VI Table 3.2 List of harmonised classification and labelling of hazardous substances (from Annex I to Council Directive 67/548/EEC)

criteria correspond to the criteria for classifying and labelling substances under Directive 67/548/EEC.

Pursuant to Regulation (EC) No 1272/2008 as of 1 December 2010 Chromium trioxide is covered by index number 024-001-00-0 in Annex VI, part 3, Table 3.1 (the list of harmonised classification and labelling of hazardous substances) of Regulation (EC) No 1272/2008 as carcinogen category 1A and mutagen category 1B respectively. Its corresponding classification in Annex VI, part 3, Table 3.2 (list of harmonised classification and labelling of hazardous substances from Annex I to Directive 67/548/EEC) of Regulation (EC) No 1272/2008 is carcinogen, category 1 and mutagen, category 2[2].

Therefore, this classification of the substance in Regulation (EC) No 1272/2008 shows that it meets the criteria for classification as carcinogenic and mutagenic in accordance with Articles 57 (a) and 57 (b) of REACH.

Registration number(s) of the substance or of substances containing the substance:

The addition of chromium trioxide to water leads to an equilibrium between chromium trioxide, chromic acid, dichromic acid and oligomers of the mentioned acids as reaction products with water. As chromium trioxide is mainly used in water, another Annex XV dossier is specifically addressing the acids generated from chromium trioxide and their oligomers.

JUSTIFICATION

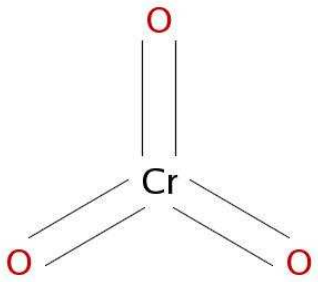
1 IDENTITY OF THE SUBSTANCE AND PHYSICAL AND CHEMICAL PROPERTIES

1.1 Name and other identifiers of the substance

Chemical Name: Chromium trioxide (CrO_3)
EC Name: Chromium trioxide
CAS Number: 1333-82-0
IUPAC Name: Trioxochromium

1.2 Composition of the substance

Chemical Name:	Chromium trioxide (CrO_3)
EC Number:	215-607-8
CAS Number:	1333-82-0
IUPAC Name:	Trioxochromium
Molecular Formula:	CrO_3
Structural Formula:	

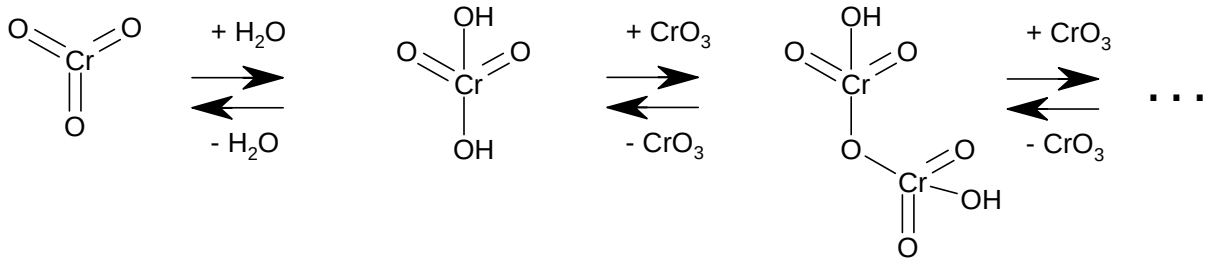


Molecular Weight:	99.99 g/mol
Typical concentration (% w/w):	Minimum > 98 %w/w
Concentration range (% w/w):	confidential

The addition of chromium trioxide to water leads to an equilibrium between chromium trioxide and chromic acid, dichromic acid and oligomers of the mentioned acids as reaction products with water (Figure 1). Depending on the concentration of chromium trioxide and the pH-value the chemical equilibrium can be shifted towards dichromic acid or higher homologues.

Another Annex XV dossier covers specifically the acids generated from chromium trioxide and their oligomers.

Figure 1: Equilibrium of Chromium trioxide and its corresponding acids in water



1.3 Physico-chemical properties [3]

Table 1: Summary of physico-chemical properties

REACH ref Annex, §	Property	IUCLID section	Value	Reference
VII, 7.1	Physical state at 20°C and 101.3 kPa	4.1	solid	Merck, 1983
VII, 7.2	Melting/freezing point	4.2	196 °C	EC, 2005
VII, 7.3	Boiling point	4.3	n/a decomposes at ~250°C to Cr_2O_3 and O_2	EC, 2005
VII, 7.5	Vapour pressure	4.6	n/a inorganic ionic compound	EC, 2005
VII, 7.7	Water solubility	4.8	~1667 g/l at 20°C (a 1% solution has a pH<1)	EC, 2005
VII, 7.8	Partition coefficient n-octanol/water (log value)	4.7	n/a inorganic ionic compound	EC, 2005
XI, 7.16	Dissociation constant	4.21	---	
VII, 7.4	Relative Density	4.4	~2.7	EC, 2005

[3] "Physico-chemical parameters such as boiling point, octanol-water partition coefficient and vapour pressure have little meaning for solid ionic inorganic compounds such as (....) chromates. The melting and decomposition characteristics of these compounds are well known and can be accessed in literature dating back to the 19th century. The most pertinent parameters are the high water solubility and the strong oxidising properties in acidic solutions to organic materials, particularly in the case of chromium trioxide." [EC, 2005]

2 HARMONISED CLASSIFICATION AND LABELLING

Chromium trioxide is covered by Index number 024-001-00-0 in Annex VI, part 3 of Regulation (EC) No 1272/2008 as follows:

Table 2: Classification according to part 3 of Annex VI, Table 3.2 (list of harmonized classification and labelling of hazardous substances from Annex I of Council Directive 67/548/EEC) of Regulation (EC) No 1272/2008

Index No	International Chemical Identification	EC No	CAS No	Classification	Labelling	Concentration Limits	Notes
024-001-00-0	chromium (VI) trioxide	215-607-8	1333-82-0	O; R9 Carc. Cat. 1; R45 Muta. Cat. 2; R46 Repr. Cat. 3; R62 T+; R26 T; R24/25-48/23 C; R35 R42/43 N; R50-53	O; T+; N R: 45-46-9-24/25-26-35-42/43-48/23-62-50/53 S: 53-45-60-61	C: R35: C ≥ 10 % C; R34: 5 % ≤ C < 10 % Xi; R36/37/38: 1 % ≤ C < 5 %	E

Table 3: Classification according to part 3 of Annex VI, Table 3.1 ((list of harmonised classification and labelling of hazardous substances) of Regulation (EC) No 1272/2008

Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling			Spec. Conc. Limits, M-factors	Notes
				Hazard Class and Category Code(s)	Hazard statement code(s)	Pictogram, Signal Word Code(s)	Hazard statement code(s)	Suppl. Hazard statement code(s)		
024-001-00-0	chromium (VI) trioxide	215-607-8	1333-82-0	Ox. Sol. 1 Carc. 1A Muta. 1B Repr. 2 Acute Tox. 2 * Acute Tox. 3 * Acute Tox. 3 * STOT RE 1 Skin Corr. 1A Resp. Sens. 1 Skin Sens. 1 Aquatic Acute 1 Aquatic Chronic 1	H271 H350 H340 H361f *** H330 H311 H301 H372 ** H314 H334 H317 H400 H410	GHS03 GHS06 GHS08 GHS05 GHS09 Dgr	H271 H350 H340 H361f *** H330 H311 H301 H372 ** H314 H334 H317 H410		STOT SE 3; H335: C ≥ 1 %	

* explanation see chapter 1.2.1 of Annex VI of regulation 1272/2008 EC

** explanation see chapter 1.2.2 of Annex VI of regulation 1272/2008 EC

*** explanation see chapter 1.2.3 of Annex VI of regulation 1272/2008 EC

3 ENVIRONMENTAL FATE PROPERTIES

Not relevant for this dossier.

4 HUMAN HEALTH HAZARD ASSESSMENT

Chromium trioxide shows various toxicological properties like acute and chronic toxicity, corrosivity as well as skin and respiratory sensitisation. Furthermore chromium trioxide is a reproductive toxicant, a germ cell toxicant and in particular, a carcinogenic substance.

Health effects of soluble hexavalent chromium compounds have been reviewed in the Risk Assessment Report on chromium trioxide, sodium dichromate, sodium chromate, ammonium dichromate and potassium dichromate [EC 2005] which is mainly based on reviews from Cross et al. [1997] and Fairhurst and Minty [1989]. Furthermore comprehensive information including more recent studies has been presented by IARC [1990], ATSDR [2000], US EPA [1998a, 1998b], NIOSH [2008], Hartwig [2010] and the French annex XV draft dossiers on sodium chromate, potassium chromate, potassium dichromate and ammonium chromate [France, 2010a-d].

5 ENVIRONMENTAL HAZARD ASSESSMENT

Not relevant for this dossier.

6 CONCLUSIONS ON THE SVHC PROPERTIES

6.1 PBT, vPvB assessment

Not relevant for this dossier.

6.2 CMR assessment

Chromium trioxide is classified under index number 024-001-00-0 of Regulation (EC) No 1272/2008 as carcinogen category 1A (H350: “May cause cancer.”) that corresponds to classification carcinogen category 1 (R45: “May cause cancer.”) and as mutagen category 1B (H340: “May cause genetic defects”) that corresponds to classification as mutagen category 2 (R46 “May cause heritable genetic damage”).

Therefore, this classification of the substance in Regulation (EC) No 1272/2008 shows that it meets the criteria for classification as carcinogenic and mutagenic in accordance with Articles 57 (a) and 57 (b) of REACH.

6.3 Substances of equivalent level of concern assessment

Not relevant for this dossier.

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France (2010c)
Annex XV Dossier **Potassium dichromate**. Proposal for identification of a substance as a CMR Cat 1 or 2, PBT, vPvB or a substance of an equivalent level of concern, Submitted by France, February 2010

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