European Chemicals Agency

Substance name: Acids generated from chromium trioxide and their oligomers

Names of the acids and their oligomers:

Chromic acid EC Number 231-801-5
CAS Number 7738-94-5

Dichromic acid EC Number 236-881-5
CAS Number 13530-68-2

Oligomers of chromic acid and dichromic acid
EC Number not yet assigned
CAS Number not yet assigned

MEMBER STATE COMMITTEE SUPPORT DOCUMENT FOR IDENTIFICATION OF ACIDS GENERATED FROM CHROMIUM TRIOXIDE AND THEIR OLIGOMERS AS A SUBSTANCE OF VERY HIGH CONCERN BECAUSE OF ITS CMR PROPERTIES

Adopted on 2 December 2010

CONTENTS

TABLES

FIGURES

Substance Name: Acids generated from chromium trioxide and their oligomers

Names of the acids and their oligomers:

Chromic acid	**EC Number**	**231-801-5**
	CAS Number	**7738-94-5**
Dichromic acid	**EC Number**	**236-881-5**
	CAS Number	**13530-68-2**
Oligomers of chromic acid and dichromic acid		
	EC Number	**not yet assigned**
	CAS Number	**not yet assigned**

- *Acids generated from chromium trioxide and their oligomers* are identified as substances meeting the criteria of Article 57(a) of Regulation (EC) 1907/2006 (REACH) owing to their classification in the hazard class carcinogenicity 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 carcinogen category 2[2].

Summary of how the substances meet the Carcinogen 1B criteria

Prior to 1 December 2010 Articles 57 (a) 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 in accordance with Directive 67/548/EEC.

As of 1 December 2010 Articles 57(a) 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.

The original Annex XV dossier of Germany for acids generated from chromium trioxide and their oligomers was submitted before 1 December 2010 and therefore proposed that the substance is identified as meeting the criteria under Article 57(a) of the version of REACH existing at that time, i.e., the substance meets the criteria for classification as carcinogen 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 acids generated from chromium trioxide and their oligomers are chromium VI compounds and therefore are covered by entry 024-017-00-8 in Annex VI, part 3, Table 3.1 (the list of harmonised classification and labelling of hazardous substances) of Regulation (EC) No 1272/2008 and are classified as carcinogen category 1B. The 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 2[2].

Therefore, this classification of the substances in Regulation (EC) No 1272/2008 shows that they meet the criteria for classification as carcinogen in accordance with Article 57 (a) of REACH.

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

Not relevant for this dossier.

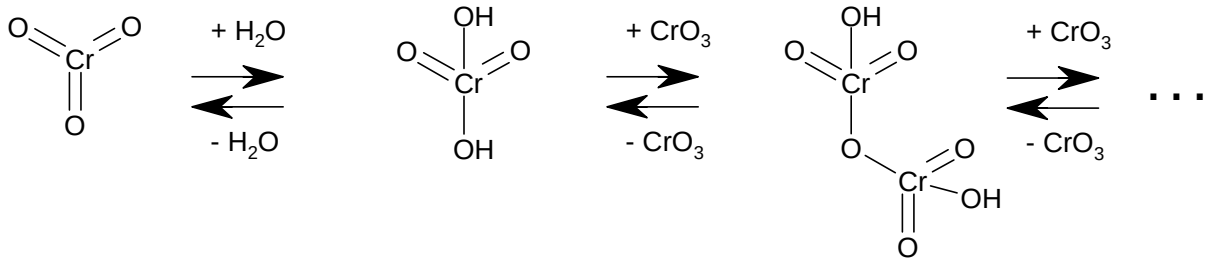
JUSTIFICATION

1 IDENTITY OF THE SUBSTANCE AND PHYSICAL AND CHEMICAL PROPERTIES

1.1 Name and other identifiers of the substances

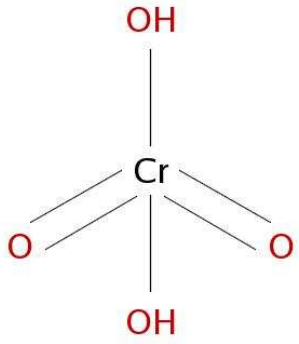
The addition of chromium trioxide to water leads to an equilibrium between chromium trioxide and chromic acid, dichromic acid and oligomers of the mentioned acids as reaction products with water (Figure 1). Depending on the concentration of chromium trioxide and the pH-value the chemical equilibrium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

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

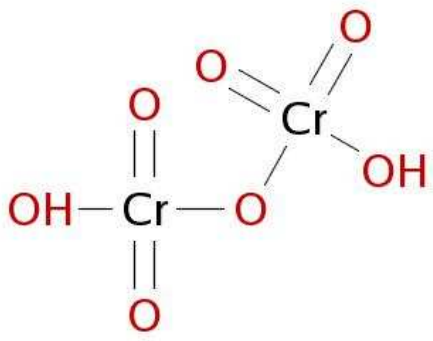


Another Annex XV dossier covers specifically chromium trioxide.

1.2 Composition of the substances

Chemical Name:	Chromic acid (H_2CrO_4)
EC Number:	231-801-5
CAS Number:	7738-94-5
IUPAC Name:	dihydroxy(dioxo)chromium
Molecular Formula:	CrH_2O_4
Structural Formula:	
Molecular Weight:	118.01 g/mol
Typical concentration (% w/w):	---
Concentration range (% w/w):	---

Chemical Name:	Dichromic acid ($H_2Cr_2O_7$)
EC Number:	236-881-5
CAS Number:	13530-68-2
IUPAC Name:	hydroxy-(hydroxy(dioxo)chromio)oxy-dioxochromium
Molecular Formula:	$Cr_2H_2O_7$
Structural Formula:	



Molecular Weight:	218 g/mol
Typical concentration (% w/w):	---
Concentration range (% w/w):	---

Chemical Name:	Oligomers of chromic acid and dichromic acid
EC Number:	---
CAS Number:	---
IUPAC Name:	---
Molecular Formula:	---
Structural Formula:	---
Molecular Weight:	---
Typical concentration (% w/w):	---
Concentration range (% w/w):	---

1.3 Physico-chemical properties

Table 1: Summary of physico-chemical properties

REACH ref Annex, §	Property	IUCLID section	Value	Reference
Chromic acid				
VII, 7.1	Physical state at 20°C and 101.3 kPa	4.1		
VII, 7.2	Melting/freezing point	4.2	196°C	Hazardous Substances Data Bank, 2010
VII, 7.3	Boiling point	4.3		
VII, 7.5	Vapour pressure	4.6		
VII, 7.7	Water solubility	4.8	1854 g/l at 20 °C	IFA, 2008
VII, 7.8	Partition coefficient n-octanol/water (log value)	4.7		
XI, 7.16	Dissociation constant	4.21		
VII, 7.4	Density	4.4	1.67-2.82 g/cm^3	Hazardous Substances Data Bank, 2010
Dichromic acid				
VII, 7.1	Physical state at 20°C and 101.3 kPa	4.1		
VII, 7.2	Melting/freezing point	4.2		
VII, 7.3	Boiling point	4.3		
VII, 7.5	Vapour pressure	4.6		
VII, 7.7	Water solubility	4.8		
VII, 7.8	Partition coefficient n-octanol/water (log value)	4.7		
XI, 7.16	Dissociation constant	4.21		
VII, 7.4	Relative Density	4.4		

2 HARMONISED CLASSIFICATION AND LABELLING

Acids generated from chromium trioxide and their oligomers are chromium VI compounds and therefore are covered by Index number 024-017-00-8 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 to 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
024-017-00-8	chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex	-	-	Carc. Cat. 2; R49 R43 N; R50-53	T; N R: 49-43-9--50/53 S: 53-45-60-61		A

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)		
024-017-00-8	chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex	-	-	Carc. 1B Skin Sens. 1 Aquatic Acute 1 Aquatic Chronic 1	H350i H317 H400 H410	GHS07 GHS08 GHS09 Dgr	H350i H317 H410			A

* 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

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

Acids generated from chromium trioxide and their oligomers are chromium VI compounds and therefore are covered by index number 024-017-00-8 of Regulation (EC) No 1272/2008 in Annex VI, part 3, Table 3.1 (the list of harmonised classification and labelling of hazardous substances) as carcinogen category 1B (H350i: “May cause cancer by inhalation”). The corresponding classification in Annex VI, part 3, Table 3.2 (the list of harmonised and classification and labelling of hazardous substances from Annex I to Directive 67/548/EEC) of Regulation (EC) No 1272/2008 is carcinogen category 2 (R49: “May cause cancer by inhalation”).

Therefore, this classification of the substances in Regulation (EC) No 1272/2008 shows that they meet the criteria for classification as carcinogen in accordance with Article 57 (a) of REACH.

6.3 Substances of equivalent level of concern assessment

Not relevant for this dossier.

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