

**20 June 2012**

## **Draft background document for Dichromium tris(chromate)**

### **Document developed in the context of ECHA's fourth Recommendation for the inclusion of substances in Annex XIV**

*Information comprising confidential comments submitted during public consultation, or relating to content of Registration dossiers which is of such nature that it may potentially harm the commercial interest of companies if it was disclosed, is provided in a confidential annex to this document.*

## **1. Identity of the substance**

Chemical name:	Dichromium tris(chromate)
EC Number:	246-356-2
CAS Number:	24613-89-6
IUPAC Name:	Dichromium(3+) trichromate

## **2. Background information**

### **2.1. Intrinsic properties**

Dichromium tris(chromate) was identified as a Substance of Very High Concern (SVHC) in accordance with Article 57(a) as it is classified 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 1B<sup>1</sup> (H350: "May cause cancer") and was therefore included in the candidate list for authorisation on 19 December 2011, following ECHA's decision ED/77/2011.

---

<sup>1</sup> This corresponds to a classification as carcinogen cat. 2 (R45: "May cause cancer") in Annex VI, part 3, Table 3.2 (the list of harmonised classification and labelling of hazardous substances from Annex I to Directive 67/548/EEC) of Regulation (EC) No 1272/2008.

## **2.2. Imports, exports, manufacture and uses**

### **2.2.1. Volume(s), imports/exports**

According to registration information the volume manufactured in the EU is in the range of 10 – 100 t/y. No information on import/export is available although the lead registrant reports that the “substance is manufactured or “imported” by a very small number of companies in the EU at low volume for a small number of well-controlled industrial uses” (RCOM, 2011). Almost the entire amount of 10-100 t/y of dichromium tris(chromate) is allocated to uses in the scope of authorisation (uses outside the scope of the authorisation may only include minor uses such as scientific research and development (SRD)).

### **2.2.2. Manufacture and uses**

#### **2.2.2.1. Manufacture and releases from manufacture**

According to registration information and the Annex XV dossier (2011), dichromium tris(chromate) is manufactured by less than ten manufacturers in the EU that are located in Italy, Spain, France, Germany and the UK.

The manufacturing process of dichromium tris(chromate) consists in an incomplete reduction of chromium trioxide and a precipitation of trivalent chromium with the chromate anion (Annex XV dossier, 2011). Dichromium tris(chromate) can also be manufactured by reduction of a chromic acid solution in water. Application of the latter manufacturing process is confirmed in the registration dossiers.

Manufacture of dichromium tris(chromate) is carried out in a mainly enclosed system (cf. PROC 3). The lead registrant reports that the substance is manufactured “under strictly controlled conditions” (RCOM, 2011). However, occupational exposure cannot be excluded and potential for exposure can arise from maintenance and sampling activities (Annex XV dossier (2011) and Registrations).

#### **2.2.2.2. Uses and releases from uses**

According to the Annex XV dossier (2011), dichromium tris(chromate) is mainly used for surface treatment of metals due to its corrosion inhibiting properties (the substance reacts on contact with the metal surface to form a thin metal oxide conversion layer on the surface of the treated metal). Applications of the substance include (Registrations & Annex XV dossier, 2011):

- formulation of metal treatment products and
- industrial surface treatment of metals with reactive anti-corrosion primer for steel and aluminium (e.g. in the construction and the aeronautic sectors).

As a further minor application identified in the registration dossiers, dichromium tris(chromate) is used to analyse and control its quality during manufacture. Application as a catalyst in the mordanting of yarns is a use that has been reported in the Annex XV dossier (2011) as not confirmed and also is not identified in the registration dossiers.

Occupational exposure cannot be excluded and its extent depends on the operational conditions and risk management measures in place. According to information provided in the registrations and in the Annex XV dossier (2011) the substance is applied for surface treatment of metals by dipping, brushing, roller application or manual spraying. Aerosols generated during the mentioned applications bear a high potential for exposure of workers.

In the Annex XV dossier (2011) recent monitoring results regarding exposure to chromium (VI) via air at the workplace in different metal working sectors in France, among them the "metal treatment and surface finishing" sector, are reported. The data indicate that French workers in the metal treatment and surface finishing sector are exposed via the respiratory route to non-negligible concentrations of chromium (VI) compounds (25<sup>th</sup>, 75<sup>th</sup> and 90<sup>th</sup> percentile of 8 h average monitoring values, respectively: 0.5, 1.0 and 3.0  $\mu\text{g CrVI}/\text{m}^3$ ).

Furthermore, recent exposure information reported in the Annex XV dossier for chromium trioxide (2010) prepared by Germany shows that also German workers are exposed to significant concentrations of chromium (VI) in workplace air<sup>2</sup> in sectors such as "formulation of metal treatment products" and "surface treatment".

Based on this recent information on exposure of French and German workers to Cr(VI) resulting from uses and processes in which also dichromium tris(chromate) is used, it can be assumed that other European workers are also likely to be exposed to non-negligible concentrations of Cr(VI) compounds, among them dichromium tris(chromate).

### **2.2.2.3. Geographical distribution and conclusions in terms of (organisation and communication in) supply chain**

There is no specific information available regarding the geographical distribution of the uses of dichromium tris(chromate).

The exact number of sites of use of dichromium tris(chromate) in the EU is unknown. In the registrations it is reported that several sites are involved whereas in the Annex XV dossier (2011) it is stated that a high number of enterprises are involved in surface treatment activities (mainly small or medium size enterprises). Information received during the public consultation on the SVHC identification of the substance (RCOM, 2011) indicates use at a small number of industrial sites with a well-defined supply chain (passivation-coil coating). Due to these uncertainties regarding the number of industrial sites a medium to high number of sites is assumed.

---

<sup>2</sup> The exposure values provided in tables 7 – 19 of the Annex XV dossier for chromium trioxide are expressed in  $\mu\text{g CrO}_3/\text{m}^3$  air (and not as  $\mu\text{g CrVI}/\text{m}^3$  as erroneously stated in the dossier; by division of the given values by 2 an approximate transformation of  $\text{CrO}_3/\text{m}^3$  to  $\text{CrVI}/\text{m}^3$  can be achieved).

### **2.3. Availability of information on alternatives<sup>3</sup>**

Some information is available on alternatives for metal surface treatment in the Annex XV dossier on dichromium tris(chromate) (2011).

According to the Annex XV dossier (2011), regarding the passivation of galvanized steel sheets for which dichromium tris(chromate) may be used, substitution of the substance seems to be effective (but still to be implemented in Eastern Europe). In the aeronautic and military sectors, research for alternatives has been ongoing for several years already but further research is still needed as none of the presently known possible alternatives appear to fulfil the technical and airworthiness safety requirements for aircrafts.

### **2.4. Existing specific Community legislation relevant for possible exemption**

There seems to be no specific Community legislation in force that would allow to consider exemption of (categories of) uses from the authorisation requirement on the basis of Article 58(2) of the REACH Regulation.

### **2.5. Any other relevant information (e.g. for priority setting)**

Not available.

---

<sup>3</sup> Please note that this information was not used for prioritisation.

### 3. Conclusions and justification

#### Prioritisation

The volume of the substance supplied to uses in the scope of authorisation is relatively low. Uses of the substance take place at a medium to high number of industrial sites. Releases and exposure to workers might be controlled in most instances, however some of the uses have a potential for significant worker exposure.

#### *Verbal-argumentative approach*

On the basis of the criteria, the substance has moderate priority.

#### *Scoring approach*

Score			Total Score
Inherent properties (IP)	Volume (V)	Uses - wide dispersiveness (WDU)	(= IP + V + WDU)
Score: 1  Art. 57 (a); Carc 1B	Score: 3  Relatively low volume allocated to uses in the scope of authorisation (10-100 t/y)	Overall score: (2 or 3) * 3 = 6-9  Site-#: 2-3 Used at a medium to high number of industrial sites (>10 - > 100) Release: 3 Releases and exposure to workers might be controlled in most instances, however some of the uses have a potential for significant worker exposure	10-13

#### *Conclusion, taking regulatory effectiveness considerations into account*

On the basis of the prioritisation criteria dichromium tris(chromate) gets moderate priority for inclusion in Annex XIV.

There are other chromium (VI) compounds already recommended for inclusion in Annex XIV such as sodium dichromate and potassium dichromate which potentially could be replaced by dichromium tris(chromate) in surface treatment.

**Therefore, it is proposed to recommend dichromium tris(chromate) for inclusion in Annex XIV.**

## 4. References

Annex XV (2010) – Chromium trioxide. Proposal for identification of a substance as a Category 1A or 1B CMR, PBT, vPvB or a substance of an equivalent level of concern. Submitted by Germany, August 2010.

<http://echa.europa.eu/documents/10162/20ee121d-0db9-4c97-ae32-d18d1f4b3ff4>

Annex XV (2011) – Dichromium tris(chromate). Proposal for identification of a substance as a Category 1A or 1B CMR, PBT, vPvB or a substance of an equivalent level of concern. Submitted by France, August 2011.

<http://echa.europa.eu/documents/10162/2f010b6e-e418-43fb-854d-3caad9970470>

RCOM (2011) – “Responses to comments” documents. Document compiled by the French CA from the commenting period 29/08/2011 – 13/10/2011 on the identification of Dichromium tris(chromate) as SVHC.

<http://echa.europa.eu/web/guest/identification-of-svhc>