Annex XV Dossier

Cobalt Dichloride

EC Number: 231-589-4

CAS Number: 7646-79-9

PROPOSAL FOR IDENTIFICATION OF A SUBSTANCE AS A CMR CAT 1 OR 2, PBT, vPvB OR A SUBSTANCE OF AN EQUIVALENT LEVEL OF CONCERN

It is proposed to identify the substance as a CMR according to Article 57 (a), (b) and/or (c).

Submitted by: France

Version: 2 June 2008

CONTENTS

PROPOSAL FOR IDENTIFICATION OF A SUBSTANCE AS A CMR CAT 1 OR 2, PBT, VPVB OR A SUBSTANCE OF AN EQUIVALENT LEVEL OF CONCERN

Substance Name: Cobalt dichloride

EC Number: 231-589-4

CAS number: 7646-79-9

Summary of how the substance meets the CMR (Cat 1 or 2), PBT or vPvB criteria, or is considered to be a substance of an equivalent level of concern

Cobalt Dichloride has been identified as a CMR according to the 25th ATP to Directive 67/548/EEC, updated in the 29th ATP to Directive 67/548/EEC, in which the cobalt dichloride has been classified as a carcinogen Cat 2/ R49 (may cause cancer by inhalation) and then has been included in the Annex I of the Directive 67/548/EEC.

Moreover, the Cobalt dichloride is suspected to be an endocrine disrupter. On the basis of the CMR-2 classification and the variety of uses making difficult to guarantee that the uses of this substance is not dispersive, Cobalt dichloride has been identified as of very high concern.

JUSTIFICATION

1.1. IDENTITY OF THE SUBSTANCE AND PHYSICAL AND CHEMICAL PROPERTIES

1.1.1. NAME AND OTHER IDENTIFIERS OF THE SUBSTANCE

Chemical Name: Cobalt Dichloride

EC Name: 231-589-4

CAS Number: 7646-79-9

IUPAC Name: Cobalt(2+) dichloride

Molecular Formula: Cl2Co

Structural Formula:

Molecular Weight: 129.84

1.1.2. COMPOSITION OF THE SUBSTANCE

Typical concentration (% w/w): Not relevant / SVHC annexe XV dossier

Concentration range (% w/w): Not relevant / SVHC annexe XV dossier

1.1.3. PHYSICO-CHEMICAL PROPERTIES

Table 1: Summary of physico-chemical properties

REACH ref Annex, §	Property	IUCLID section	Value
VII, 7.1	Physical state at 20°C and 101.3 kPa	3.1	Solid (crystals)
VII, 7.2	Melting/freezing point	3.2	86°C
VII, 7.3	Boiling point	3.3	110°
VII, 7.5	Vapour pressure	3.6	40 mmHg at 770°C
VII, 7.7	Water solubility	3.8	76.7g/100ml at 0°C
VII, 7.8	Partition coefficient n-octanol/water (log value)	3.7 partition coefficient	Not available
XI, 7.16	Dissociation constant	3.21	Not available

1.2. MANUFACTURE AND USES

As information on uses may be useful for prioritisation for inclusion in annex XIV, this is summarised hereafter:

- Used as absorbent for ammonia gas in the chemical industry.
- Used for gas masks.
- Used as a humidity indicator in several applications as hygrometers, barometers, self-indicating silica gels.
- Used for manufacturing vitamin B12.
- Used to add the cobalt trace element as nutrients in human and animal food.
- Used to add the cobalt trace element in nitrate fertilizers.
- Used for flux for magnesium refining, notably when recycling scrap material. Fluxes mixtures of salts have two basic functions, to remove certain impurities from magnesium and to protect the molten metal from contact with the atmosphere.
- Used as dye mordant for glass industry (paints on glass surface).
- Used as solid lubricant (for cutting tools for example).
- Used as catalysts in organic reactions as hydrogenation and desulfurization.
- Formulation of invisible inks.
- Used as a metal drier in air-drying coatings.
- Used as drying agent in paints, lacquers, varnishes and printing inks.
- Production of Non-ferrous metals (alloy used in aircraft turbines).
- Used for electroplating processes (galvanoplasty).
- "Oxyvore" for the chemical degassing of the dissolved oxygen generated during processes in metal industry.
- Additive in the rubber manufacturing to improve the adhesion of the rubber with metal armatures, this application concern in particular the tire industry.
- This list may not be exhaustive, notably cobalt dichloride could be used in other inorganic chemical products.

1.3. CLASSIFICATION AND LABELLING

1.3.1. CLASSIFICATION IN ANNEX I OF DIRECTIVE 67/548/EEC

According to the 25th ATP to Directive 67/548/EEC, updated in the 29th ATP to Directive 67/548/EEC, the cobalt dichloride has been classified as a carcinogen Cat 2/ R49: May cause cancer by inhalation and then has been included in the Annex I of the Directive 67/548/EEC.

Its Annex I to Directive 67/548/EEC Index number is 027-004-00-5.

The Cobalt Dichloride is classified, according to Directive 67/548/EEC, as:

- R49: May cause cancer by inhalation.
- R22: Harmful if swallowed.
- R42/43: May cause sensitization by inhalation and skin contact.

- R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

- S2: Keep out of the reach of children.
- S22: Do not breathe dust.
- S53: Avoid exposure - obtain special instructions before use.
- S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S60: This material and its container must be disposed of as hazardous waste.
- S61: Avoid release to the environment. Refer to special instructions/Safety data sheets.

Special Concentration Limits:

Concentration	**Classification**
C ≥ 25 %	T, N; R49-22-42/43-50/53
2,5 % ≤ C < 25 %	T, N; R49-22-42/43-51/53
1 % ≤ C < 2,5 %	T; R49-42/43-52/53
0,25 % ≤ C < 1 %	T; R49-52/53
0,01 % ≤ C < 0,25 %	T; R49

1.3.2. SELF CLASSIFICATION(S)

No self classification.

INFORMATION ON USE, EXPOSURE, ALTERNATIVES AND RISKS

1.1. INFORMATION ON EXPOSURE

Please refer to Section 2 of the Justification part of this report where there is a list of the main categories of uses.

In France, the cobalt dichloride is exclusively produced by the factory SLN (group ERAMET) of Sandouville, by refining mattes of nickel of New-Caledonia. In 2006, the production rose 256t in the form of dichloride. The French consumption of cobalt dichloride was around 2000t in 2005 (Inrs 2005). This consumption was mainly for chemical removing of oxygen in the metal industry (1000t) and in the rubber manufacturing (750t).

In the final steps of nickel extraction, some types of process generate cobalt dichloride. More generally the chemical action of hydrochloric acid on powder cobalt, cobalt oxide or carbonate cobalt generates cobalt dichloride that is used on site or sold.

1.2. INFORMATION ON ALTERNATIVES

Regarding the variety of sectors in which cobalt dichloride is used and the incomplete data available, to day it cannot be affirmed that uses are not dispersive. Therefore, alternatives should be proposed.

1.2.1. Alternative substances

- In self-indicating blue (anhydrous form) to pink (hydrated form) silica gels, it was reported that iron salts could be an alternative to cobalt dichloride (Inrs, 2007). Phenolphthalein - in a concentration of 0.01% by weights – could be used as an indicator that changes from yellow when dry to green, and finally to deep blue when the gel has adsorbed approximately 5% of water by weight. Certain suppliers propose also other organic humidity indicators that give for example a colour change from orange to colourless.
- For cobalt drier, no non-metallic compounds with sufficient drying activity to substitute cobalt driers have been identified so far (Danish EPA, 2003). As the secondary driers possess no catalytic effect the alternatives to cobalt driers must necessarily be found within the group of primary driers; this means that the substitution possibilities could be limited to metallic compounds as vanadium (V) and manganese (Mn).
- For magnesium refining other processes are mentioned as remelting in the salt-free process.
- For other uses, no information is publicly available to day.

1.2.2. Alternative techniques

- For all uses, no information is publicly available to day on alternative techniques.

1.3. RISK-RELATED INFORMATION

It should be paying attention that Cobalt and cobalt compounds are collected in reports, it would only be to be begun by Iarc work that classifies them in the B group (Iarc, 1997). Many cobalt compounds are able to generate Cobalt[II] ions (Cobalt[II] hydroxide, Cobalt[II] oxide, Cobalt[II] nitrate hexahydrate, Cobalt[II]chloride hexahydrate,…) and could therefore having some similarities in their toxicity and ecotoxicity. Thus, the Classification and labelling working group concluded that “The cobalt ion was the assumed species so whether the compound was sulphate or chloride was immaterial” (Meeting of the Commission Working Group on the Classification and Labelling of Dangerous Substances, ECB Ispra, 1st - 3rd July 1998).

REFERENCES

- ECB ClassLab database http://ecb.jrc.it/classification-labelling/search-classlab/
- Fiche toxicologique de l'INRS FT128 : Cobalt et ses composés minéraux. 2000.
- Annex I of Directive 97/548/EEC.
- INERIS - Fiche de données toxicologiques et environnementales des substances chimiques : Cobalt et ses dérivés. 2006.
- Substitution of Cobalt Driers and Methyl Ethyl Ketoxime, Environmental Project 884 2003, Danish Environmental Protection Agency, 2003.
- Criteria Document for Swedish Occupational Standards: Cobalt and Cobalt Compounds, National Institute for Working Life, 2005
- Fiche d'aide à la substitution, Dichlorure de Cobalt, FAS 11, INRS, 2007.
- IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 52, November 1997.
- ECB, European Commission, Draft summary record, Meeting of the Commission Working Group on the Classification and Labelling of Dangerous Substances, version ECBI/27/98 Rev.2, December 1998.