



# SAFETY DATA SHEET

(REACH regulation (EC) n° 1907/2006 - n° 453/2010)

## SECTION 1 : IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1. Product identifier

Product name : HR 406  
Product code : 12699

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Refinery catalyst for treating petroleum cuts. (For further information, refer to the product technical data sheet).  
Alumina impregnated with cobalt and molybdenum oxides.

### Use descriptor system (REACH) :

PROC 8b / PROC 1 / PROC 2 / PROC 3  
ERC 4 / ERC 6a / ERC 6b  
PC 19 / PC 13  
SU 8

### 1.3. Details of the supplier of the safety data sheet

Registered company name : Axens.  
Address : 89, Boulevard FRANKLIN ROOSEVELT.92508.RUEIL-MALMAISON.FRANCE.  
Telephone : +33 (0)1 47 14 21 00. Fax : +33 (0)1 47 51 87 95.  
fds@axens.net  
<http://www.axens.net>

### 1.4. Emergency telephone number : +33.(0)1.45.42.59.59.

Association/Organisation : INRS / ORFILA - <http://www.centres-antipoison.net>.

### Other emergency numbers

International Emergency Telephone Number (CARECHEM) :  
+44(0) 1235 239 670 : (Europe, Americas, Middle East, Africa, Israel (Europe and English Language speaking countries)  
+44(0) 1235 239 671 : Middle East/Africa (Arabic speaking countries)  
Asia-Pacific region (excluding China) : +65 3158 1074  
China : +86 10 5100 3039  
USA/Canada : +1 215 207 0061

## SECTION 2 : HAZARDS IDENTIFICATION

### 2.1. Classification of the substance or mixture

#### In compliance with EC regulation No. 1272/2008 and its amendments.

Eye irritation, Category 2 (Eye Irrit. 2, H319).  
Skin sensitisation, Category 1 (Skin Sens. 1, H317).  
Carcinogenicity, Category 2 (Carc. 2, H351).  
Hazardous to the aquatic environment - Acute hazard, Category 1 (Aquatic Acute 1, H400).  
Hazardous to the aquatic environment - Chronic hazard, Category 1 (Aquatic Chronic 1, H410).  
This mixture does not present a physical hazard. Refer to the recommendations regarding the other products present on the site.

#### In compliance with directives 67/548/EEC, 1999/45/EC and their amendments.

Skin sensitisation (Xi, R 43).  
Category 3 carcinogen (Xn, R 40 Carc. Cat. 3).  
Aquatic environmental hazard, chronic toxicity: very toxic (N, R 50/53).  
This mixture does not present a physical hazard. Refer to the recommendations regarding the other products present on the site.

### 2.2. Label elements

#### In compliance with EC regulation No. 1272/2008 and its amendments.

Hazard pictograms :



GHS07

GHS09

GHS08

Signal Word :

WARNING

Product identifiers :

EC 215-204-7

MOLYBDENUM TRIOXIDE

EC 215-154-6

COBALT OXIDE

Hazard statements :

H317

May cause an allergic skin reaction.

H319

Causes serious eye irritation.

H351

Suspected of causing cancer .

H410

Very toxic to aquatic life with long lasting effects.

Precautionary statements - Prevention :

P201

Obtain special instructions before use.

P202

Do not handle until all safety precautions have been read and understood.

P261

Avoid breathing dust/fume/gas/mist/vapours/spray.

P272

Contaminated work clothing should not be allowed out of the workplace.

P273

Avoid release to the environment.

P281

Use personal protective equipment as required.

Precautionary statements - Response :

P302 + P352

IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P313

IF exposed or concerned: Get medical advice/attention.

P333 + P313

If skin irritation or rash occurs: Get medical advice/attention.

P337 + P313

If eye irritation persists: Get medical advice/attention.

P363

Wash contaminated clothing before reuse.

P391

Collect spillage.

Precautionary statements - Disposal :

P501

Dispose of contents/container in accordance with current legislation, preferably by a collector or an approved company.



### 2.3. Other hazards

The mixture does not contain any substances classified as 'Substances of Very High Concern' (SVHC) by the European Chemicals Agency (ECHA) under article 57 of REACH: <http://echa.europa.eu/fr/candidate-list-table>

The mixture satisfies neither the PBT nor the vPvB criteria for mixtures in accordance with annexe XIII of the REACH regulations EC 1907/2006.

Avoid the formation or spread of dust in the atmosphere.

## SECTION 3 : COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substances

No substances fulfil the criteria set forth in annexe II section A of the REACH regulation (EC) n° 1907/2006.

### 3.2. Mixtures



#### Composition :

Wng : Warning

Identification	(EC) 1272/2008	67/548/EEC	Note	%
INDEX: 1344_28_1 CAS: 1344-28-1 EC: 215-691-6 REACH: 01-2119529248-35			[1]	50 <= x % < 100
ALUMINIUM OXIDE				
INDEX: 042_001_00_9 CAS: 1313-27-5 EC: 215-204-7 REACH: 01-2119488038-30	GHS07, GHS08 Wng Eye Irrit. 2, H319 STOT SE 3, H335 Carc. 2, H351	Xn Carc. Cat. 3;R40 Xi;R36/37	[1] [2]	10 <= x % < 25

MOLYBDENUM TRIOXIDE				
INDEX: 027_002_00_4 CAS: 1307-96-6 EC: 215-154-6 REACH: 01-2119532645-38	GHS07, GHS09 Wng Acute Tox. 4, H302 Skin Sens. 1, H317 Aquatic Acute 1, H400 M Acute = 10	Xn,N Xn;R22 Xi;R43 N;R50/53	[1]	2.5 <= x % < 10
COBALT OXIDE	Aquatic Chronic 1, H410 M Chronic = 10			

**Information on ingredients :**

- [1] Substance for which maximum workplace exposure limits are available.  
[2] Carcinogenic, mutagenic or reprotoxic (CMR) substance.

**SECTION 4 : FIRST AID MEASURES**

As a general rule, in case of doubt or if symptoms persist, always call a doctor.  
NEVER induce swallowing by an unconscious person.

**4.1. Description of first aid measures****In the event of exposure by inhalation :**

Move the affected person away from the contaminated area and into the fresh air.

**In the event of splashes or contact with eyes :**

Wash thoroughly with soft, clean water for 15 minutes holding the eyelids open.  
If there is any redness, pain or visual impairment, consult an ophthalmologist.

**In the event of splashes or contact with skin :**

Remove contaminated clothing and wash the skin thoroughly with soap and water or a recognised cleaner.  
Watch out for any remaining product between skin and clothing, watches, shoes, etc.  
In the event of an allergic reaction, seek medical attention.  
If the contaminated area is widespread and/or there is damage to the skin, a doctor must be consulted or the patient transferred to hospital.

**In the event of swallowing :**

Do not give the patient anything orally.  
In the event of swallowing, if the quantity is small (no more than one mouthful), rinse the mouth with water and consult a doctor.  
Seek medical attention immediately, showing the label.

**4.2. Most important symptoms and effects, both acute and delayed**

The main symptoms and effects known are described in the label (§ 2) and / or in section 11.

**4.3. Indication of any immediate medical attention and special treatment needed**

Symptomatic treatment.

**SECTION 5 : FIREFIGHTING MEASURES**

Non-flammable.

**5.1. Extinguishing media****Suitable methods of extinction**

All extinguishing agents can be used.

**Unsuitable methods of extinction**

None to our knowledge. If there is a fire close by, use suitable extinguishing agents.

**5.2. Special hazards arising from the substance or mixture**

A fire will often produce a thick black smoke. Exposure to decomposition products may be hazardous to health.  
Do not breathe in smoke.  
In the event of a fire, the following may be formed :  
- carbon dioxide (CO<sub>2</sub>)

**5.3. Advice for firefighters**

No data available.

**SECTION 6 : ACCIDENTAL RELEASE MEASURES****6.1. Personal precautions, protective equipment and emergency procedures**

Consult the safety measures listed under headings 7 and 8.

**For non fire-fighters**

Avoid any contact with the skin and eyes.

**For fire-fighters**

Fire-fighters will be equipped with suitable personal protective equipment (See section 8).

**6.2. Environmental precautions**

Prevent any material from entering drains or waterways.

**6.3. Methods and material for containment and cleaning up**

Retrieve the product by mechanical means (sweeping/vacuuming).

If necessary, wash with water following recovery.

**6.4. Reference to other sections**

No data available.

**SECTION 7 : HANDLING AND STORAGE**

Requirements relating to storage premises apply to all facilities where the mixture is handled.

Individuals with a history of skin sensitisation should not, under any circumstance, handle this mixture.

**7.1. Precautions for safe handling**

Always wash hands after handling.

Remove and wash contaminated clothing before re-using.

Avoid the formation or spread of dust in the atmosphere.

Ventilation.

Do not mix with incompatible materials (See list section 10).

Do NOT handle without gloves.

**Fire prevention :**

Prevent access by unauthorised personnel.

**Recommended equipment and procedures :**

For personal protection, see section 8.

Observe precautions stated on label and also industrial safety regulations.

Avoid skin and eye contact with this mixture.

Avoid exposure - obtain special instructions before use.

**Prohibited equipment and procedures :**

No smoking, eating or drinking in areas where the mixture is used.

**7.2. Conditions for safe storage, including any incompatibilities**

No data available.

**Storage**

Keep the container tightly closed in a cool, well ventilated place.

Keep away from incompatible materials.

To guarantee the quality and properties of the product keep :

- protected from humidity and bad weather conditions.

**Packaging**

Always keep in packaging made of an identical material to the original.

**7.3. Specific end use(s)**

INFORMATION ON EXPOSURE SCENARIOS

- Volume of room > 1,000 m<sup>3</sup>

- Process temperature < 160 °C (if closed process, < 600 °C)

- Cleaning with compressed air prohibited

- Apply good hygiene practices at the workstation

**SECTION 8 : EXPOSURE CONTROLS/PERSONAL PROTECTION**

**8.1. Control parameters**

INFORMATION ON EXPOSURE SCENARIOS

- Yearly Tonnage:

ES1: 13,380 t/yr (MoO<sub>3</sub>); 226.1 t/yr (Co)

ES2/3: 5,500 t/yr (MoO<sub>3</sub>); 75 t/yr (CoO)

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- Day with maximum emission:

For water:

ES1: 350 d/yr (MoO<sub>3</sub>); 360 d/yr (CoO)

ES2: 265 d/yr (MoO<sub>3</sub>)

For air:

ES1: 269 d/yr (MoO<sub>3</sub>); 295 d/yr (CoO)ES2: 250 d/yr (MoO<sub>3</sub>)

- Surface water flow:

ES1: 18,000 m<sup>3</sup>/d (MoO<sub>3</sub>); 162,782 m<sup>3</sup>/d (CoO)ES2: 18,000 m<sup>3</sup>/d (MoO<sub>3</sub>)

- Dilution capacity:

Surface water:

ES1: 10 (MoO<sub>3</sub>); 200 (CoO)ES2: 10 (MoO<sub>3</sub>)

Sea water:

ES1: 100 (MoO<sub>3</sub>); 200 (CoO)ES2: 100 (MoO<sub>3</sub>)

- Effectiveness of water treatment station:

ES1: Between 92% and 99% (MoO<sub>3</sub>); 99% (CoO)ES2: Between 92% and 99% (MoO<sub>3</sub>)

- Effluent flow from the factory:

ES1: 2,000 m<sup>3</sup>/d (MoO<sub>3</sub>); 818 m<sup>3</sup>/d (CoO)ES2: 2,000 m<sup>3</sup>/d (MoO<sub>3</sub>)

- Water release factor:

ES1: 286 g/t (MoO<sub>3</sub>); 32 g/t for 0.02 Kg/d (CoO)ES2: 6,000 g/t (MoO<sub>3</sub>)

- Airborne release factor:

ES1: 163 g/t (MoO<sub>3</sub>); 38.9 g/t for 0.03 Kg/d (CoO)ES2: 1,000 g/t (MoO<sub>3</sub>)**Occupational exposure limits :**

- ACGIH TLV (American Conference of Governmental Industrial Hygienists, Threshold Limit Values, 2010) :

CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	10 mg/m <sup>3</sup>	-	-	-	-

- Australia (NOHSC: 3008, 1995) :

CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	10 mg/m <sup>3</sup>	-	-	-	-

- Belgium (Order of 19/05/2009, 2010) :

CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	10 mg/m <sup>3</sup>	-	-	-	-

- Canada / Alberta (Occupational health and safety code, 2009) :

CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	10 mg/m <sup>3</sup>	-	-	-	-

- Canada / British Colombia (2009) :

CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	-	-	T

- Canada / Quebec (Regulations on occupational health and safety) :

CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	10 mg/m <sup>3</sup>	-	-	-	T

- China (GBZ 2.1, 2007) :

CAS	TWA :	STEL :	Anm :	TWA :	STEL :	Anm :
1344-28-1	4 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	-	-	T	
1307-96-6	0.05 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>	-	-	-	

- Denmark (2007) :

CAS	TWA :	TWA :	Anm :			
1344-28-1	-	5 mg/m <sup>3</sup>	-			

- France (INRS - ED984 :2008) :

CAS	VME-ppm :	VME-mg/m <sup>3</sup> :	VLE-ppm :	VLE-mg/m <sup>3</sup> :	Notes :	TMP No :
1344-28-1	-	10	-	-	-	-

- Finland (HTP-värden 2009) :

CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1313-27-5	5 mg/m <sup>3</sup>	-	-	-	-
1307-96-6	0.05 mg/m <sup>3</sup>	-	-	-	-

- Hong-Kong (Code of practice on control of air impurities (Chemicals substances) in the workplace, 04/2002) :

CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	10 mg/m3	-	-	-	I
- Ireland (Code of practice for the safety, Health and Welfare at Work, 2010) :					
CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	4 mg/m3	-	-	-	R
- Japan (JOSH, 20/05/2009) :					
CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	0.5 mg/m3	-	-	-	R
- Malaysia :					
CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	10 mg/m3	-	-	-	-
- Norway (Veiledning om administrative normer for forurensning i arbeidsatmosfære, May 2007) :					
CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	10 mg/m3	-	-	-	-
- Sweden (AFS 2007:2) :					
CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	2 mg/m3	-	-	-	R
- USA / OSHA PEL (Occupational Safety and Health Administration, Permissible Exposure Limits) :					
CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	5 mg/m3	-	-	-	R
- UK / WEL (Workplace exposure limits, EH40/2005, 2007) :					
CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
1344-28-1	10 mg/m3	-	-	-	TI

**Derived no effect level (DNEL) or derived minimum effect level (DMEL):**

ALUMINA/BOEHMITE : DNEL : 3000 µg/m3 (in Al2O3)

COBALT OXIDE (CAS: 1307-96-6)

**Final use:**

Exposure method:

Potential health effects:

DNEL :

**Workers.**

Inhalation.

Long term local effects.

0.051 mg de substance/m3

MOLYBDENUM TRIOXIDE (CAS: 1313-27-5)

**Final use:**

Exposure method:

Potential health effects:

DNEL :

**Workers.**

Inhalation.

Long term local effects.

3 mg de substance/m3

Exposure method:

Potential health effects:

DNEL :

Inhalation.

Long term systemic effects.

11.17 mg de substance/m3

**Predicted no effect concentration (PNEC):**

COBALT OXIDE (CAS: 1307-96-6)

Environmental compartment:

PNEC :

Soil.

7.9 mg/kg

Environmental compartment:

PNEC :

Fresh water.

0.51 µg/l

Environmental compartment:

PNEC :

Sea water.

2.36 µg/l

Environmental compartment:

PNEC :

Fresh water sediment.

9.5 mg/kg

Environmental compartment:

PNEC :

Marine sediment.

9.5 mg/kg

Environmental compartment:

PNEC :

Waste water treatment plant.

0.37 µg/l

MOLYBDENUM TRIOXIDE (CAS: 1313-27-5)

Environmental compartment:

Soil.

PNEC :	11.8 mg/kg
Environmental compartment: PNEC :	Fresh water. 12.7 mg/l
Environmental compartment: PNEC :	Sea water. 1.91 mg/l
Environmental compartment: PNEC :	Fresh water sediment. 22.6 g/kg
Environmental compartment: PNEC :	Marine sediment. 1.984 g/kg
Environmental compartment: PNEC :	Waste water treatment plant. 27.1 mg/l
ALUMINIUM OXIDE (CAS: 1344-28-1) Environmental compartment: PNEC :	Fresh water. 0.0749 mg/l
Environmental compartment: PNEC :	Waste water treatment plant. 20 mg/l

## 8.2. Exposure controls

### INFORMATION ON EXPOSURE SCENARIOS

#### - Measures to limit exposure:

Automation and confinement for conveyor operations and for processes using powders  
Local ventilation (Minimum effectiveness 90%)

#### - Personal protection:

Use of P3 masks as per standards EN143 and EN149 in the presence of dust.  
If skin contact a possibility, use type 5 EN 13982-1 clothing and EN 374 gloves

### Personal protection measures, such as personal protective equipment

Pictogram(s) indicating the obligation of wearing personal protective equipment (PPE) :



Use personal protective equipment that is clean and has been properly maintained.

Store personal protective equipment in a clean place, away from the work area.

Never eat, drink or smoke during use. Remove and wash contaminated clothing before re-using. Ensure that there is adequate ventilation, especially in confined areas.

#### - Eye / face protection

Avoid contact with eyes.

Before handling powders or dust emission, wear mask goggles in accordance with standard EN166.

Prescription glasses are not considered as protection.

Provide eyewash stations in facilities where the product is handled constantly.

Safety spectacles with side shields.

#### - Hand protection

Use suitable protective gloves that are resistant to chemical agents in accordance with standard EN374.

Gloves must be selected according to the application and duration of use at the workstation.

Protective gloves need to be selected according to their suitability for the workstation in question : other chemical products that may be handled, necessary physical protections (cutting, pricking, heat protection), level of dexterity required.

Type of gloves recommended :

- Natural latex

- Nitrile rubber (butadiene-acrylonitrile copolymer rubber (NBR))

- Neoprene® (Polychloroprene)

- PVC (polyvinyl chloride)

Recommended properties :

- Impervious gloves in accordance with standard EN374

#### - Body protection

Avoid skin contact.  
Wear suitable protective clothing.  
Work clothing worn by personnel shall be laundered regularly.  
After contact with the product, all parts of the body that have been soiled must be washed.  
Protective clothing with elasticated cuffs and closed neck.

**- Respiratory protection**

Avoid breathing dust.  
Type of FFP mask :  
Wear a disposable half-mask dust filter in accordance with standard EN149.  
Category :  
- FFP3  
Particle filter according to standard EN143 :  
- P3 (White)

**Exposure controls linked to environmental protection**

## INFORMATION ON EXPOSURE SCENARIOS

- Type of liquid effluent treatment:  
Chemical precipitation, sedimentation, filtration, electrolysis, reverse osmosis, ion exchange

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- Organisational measures:  
Include emission inspections in the management system  
Regular training on good practices and on Personal Protective Equipment

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- Type of gas effluent treatment:  
Filters, wet scrubbers, cyclones associated with other RMM, electrostatic filters  
(95 - 99.9% effective)

**SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES****9.1. Information on basic physical and chemical properties****General information :**

Physical state :	solid in granules.
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**Important health, safety and environmental information**

pH :	Not relevant.
Boiling point/boiling range :	not relevant.
Flash point interval :	not relevant.
Vapour pressure (50°C) :	not relevant.
Density :	< 1
Water solubility :	Insoluble.
Melting point/melting range :	2000 °C.
Self-ignition temperature :	not relevant.
Decomposition point/decomposition range :	not relevant.

**9.2. Other information**

No data available.

**SECTION 10 : STABILITY AND REACTIVITY****10.1. Reactivity**

No data available.

**10.2. Chemical stability**

This mixture is stable under the recommended handling and storage conditions in section 7.

**10.3. Possibility of hazardous reactions**

No data available.

**10.4. Conditions to avoid**

Avoid :  
- formation of dusts

**10.5. Incompatible materials**

Keep away from :  
- strong acids  
- strong bases  
- strong oxidising agents

**10.6. Hazardous decomposition products**



The thermal decomposition may release/form :

- carbon monoxide (CO)
- carbon dioxide (CO<sub>2</sub>)

On combustion or on thermal decomposition (pyrolysis) releases : cobalt metal and cobalt oxide.

## SECTION 11 : TOXICOLOGICAL INFORMATION

### 11.1. Information on toxicological effects

May have reversible effects on the eyes, such as eye irritation which is totally reversible by the end of observation at 21 days.

May cause an allergic reaction by skin contact.

Suspected human carcinogen.

#### 11.1.1. Substances

##### Acute toxicity :

COBALT OXIDE (CAS: 1307-96-6)

Oral route :

DL50 = 202 mg/kg

Species : Rat

OCDE Ligne directrice 401 (Toxicité aiguë par voie orale)

Dermal route :

DL50 > 2000 mg/kg

Species : Rat

OCDE Ligne directrice 402 (Toxicité aiguë par voie cutanée)

Inhalation route :

LC50 = 200 mg/l

Species : Rat

MOLYBDENUM TRIOXIDE (CAS: 1313-27-5)

Oral route :

DL50 = 3260 mg/kg

Species : Rat

OCDE Ligne directrice 401 (Toxicité aiguë par voie orale)

Dermal route :

DL50 > 2000 mg/kg

Species : Rat

OCDE Ligne directrice 402 (Toxicité aiguë par voie cutanée)

Inhalation route :

LC50 > 5.84 mg/l

Species : Rat

OCDE Ligne directrice 403 (Toxicité aiguë par inhalation)

ALUMINIUM OXIDE (CAS: 1344-28-1)

Oral route :

DL50 > 2000 mg/kg

Species : Rat

OCDE Ligne directrice 401 (Toxicité aiguë par voie orale)

Inhalation route :

LC50 > 2.3 mg/l

Species : Rat

OCDE Ligne directrice 403 (Toxicité aiguë par inhalation)

##### Serious damage to eyes/eye irritation :

MOLYBDENUM TRIOXIDE (CAS: 1313-27-5)

Corneal haze :

Average score = 0

Species : Lapin

Duration of exposure : 72 h

OCDE Ligne directrice 405 (Effet irritant/corrosif aigu sur les yeux)

Iritis :

Average score = 0

Conjunctival redness :

Average score >= 2.5 and effects totally reversible within 21 days of observation

Conjunctival oedema :

Average score = 1.33

##### Carcinogenicity :

MOLYBDENUM TRIOXIDE (CAS: 1313-27-5)

Carcinogenicity Test :

Positive.

Suspected human carcinogen.

Species : Rat

Autres lignes directrices

**Specific target organ systemic toxicity - repeated exposure :**

COBALT OXIDE (CAS: 1307-96-6)

Oral route :

C = 15 mg/kg poids corporel/jour

Species : Rat

Duration of exposure : 28 jours

Méthode REACH B.7 (Toxicité (orale) par administration répétée (28 jours))

Inhalation route :

C = 0.31 mg/litre/6h/jour

Species : Rat

Duration of exposure : 90 jours

**11.1.2. Mixture**

The product has not been tested. The indication is based on the properties of the different components.

**Acute toxicity :**

negative

**Skin corrosion/skin irritation :**

Prolonged or repeated exposure may cause skin irritation and dermatitis due to the defatting properties of the product.

**Serious damage to eyes/eye irritation :**

positive

cf. section 11.1

May cause irritation.

**Respiratory or skin sensitisation :**

positive

cf. section 11.1

May cause sensitisation.

**Germ cell mutagenicity :**

negative

**Carcinogenicity :**

positive

cf. section 11.1

**Reproductive toxicant :**

negative

**Specific target organ systemic toxicity - single exposure :**

negative

**Specific target organ systemic toxicity - repeated exposure :**

negative

**Symptoms related to the physical, chemical and toxicological characteristics**

cf section 11.1

**Mixture versus substance information**

INFORMATION ON EXPOSURE SCENARIOS

- Exposure to Molybdenum:

- ES1 (Mo):

PROC 2: 0,01 mg MoO3/m3 (RCR = 0,003)

PROC 3: 0,1 mg MoO3/m3 (RCR = 0,03)

PROC 4: 0,5 mg MoO3/m3 (RCR = 0,17)

PROC 8b: 0,1 mg MoO3/m3 (RCR = 0,03)

PROC 9: 0,1 mg MoO3/m3 (RCR = 0,03)

PROC 14: 0,1 mg MoO3/m3 (RCR = 0,03)

PROC 22: 1,54 mg MoO3/m3 (RCR = 0,51)

- ES2/3 (Mo):

PROC 1: 0,01 mg MoO3/m3 (RCR = 0,003)

PROC 2: 0,01 mg MoO3/m3 (RCR = 0,003)

PROC 3: 0,1 mg MoO3/m3 (RCR = 0,03)

PROC 8b: 0,1 mg MoO3/m3 (RCR = 0,03)

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- Exposure to Cobalt:  
- ES1/2/3 :  
Inhalation Exposure: 0.027 mg CoO / m3 (RCR = 0.525)

## SECTION 12 : ECOLOGICAL INFORMATION

Very toxic to aquatic life with long lasting effects.  
The product must not be allowed to run into drains or waterways.

### 12.1. Toxicity

#### 12.1.1. Substances

##### INFORMATION ON EXPOSURE SCENARIOS

- Environmental exposure to Molybdenum:

- ES1 (Mo):

PEC Sewage: Not Applicable

PEC Freshwater: 526 µg Mo / L (RCR = 0.04)

PEC Marine: 66 µg Mo / L (RCR = 0.03)

PEC Sediment FW: 1,453 mg Mo / Kg (RCR = 0.06)

PEC Sediment Mar: 159 mg Mo / Kg (RCR = 0.08)

PEC Terrestrial: 1.43 mg Mo / Kg (RCR = 0.12)

- ES2/3 (Mo) :

PEC Sewage: Not Applicable

PEC Freshwater: 5,978 µg Mo / L (RCR = 0.47)

PEC Marine: 611 µg Mo / L (RCR = 0.32)

PEC Sediment FW: 16,518 mg Mo / Kg (RCR = 0.73)

PEC Sediment Mar: 1,665 mg Mo / Kg (RCR = 0.84)

PEC Terrestrial: 2.43 mg Mo / Kg (RCR = 0.21)

-----  
- Environmental exposure to Cobalt:

- ES1(Co):

PEC Sewage: 0.01 mg Co / L (RCR = 0.03)

PEC Freshwater: 0.19 µg Co / L (RCR = 0.38)

PEC Marine: 0.1 µg Co / L (RCR = 0.04)

PEC Sediment FW: 6.05 mg Co / Kg (RCR = 0.64)

PEC Sediment Mar: 8.11 mg Co / Kg (RCR = 0.85)

PEC Soil: 0.015 mg Co / Kg (RCR = 0.002)

- ES2/3 (Co):

No environmental exposure under the conditions of this scenario

##### ----- COBALT OXIDE (CAS: 1307-96-6)

Fish toxicity : 0.01 < LC50 <= 0.1 mg/l  
Factor M = 10

##### MOLYBDENUM TRIOXIDE (CAS: 1313-27-5)

Fish toxicity : LC50 = 577 mg/l  
Species : Pimephales promelas  
Duration of exposure : 96 h  
Autres lignes directrices

Crustacean toxicity : EC50 = 203.2 mg/l  
Species : Daphnia magna  
Duration of exposure : 48 h  
OCDE Ligne directrice 202 (Daphnia sp., essai d'immobilisation immédiate)

Algae toxicity : ECr50 = 499.7 mg/l  
Species : Desmodesmus subspicatus  
Duration of exposure : 72 h  
OCDE Ligne directrice 201 (Algues, Essai d'inhibition de la croissance)

##### ALUMINIUM OXIDE (CAS: 1344-28-1)

Fish toxicity : LC50 > 100 mg/l  
Species : Salmo trutta  
Duration of exposure : 96 h

OCDE Ligne directrice 203 (Poisson, essai de toxicité aiguë)

Crustacean toxicity :

EC50 > 100 mg/l  
Species : Daphnia magna  
Duration of exposure : 48 h  
OCDE Ligne directrice 202 (Daphnia sp., essai d'immobilisation immédiate)

Algae toxicity :

ECr50 > 100 mg/l  
Species : Selenastrum capricornutum  
Duration of exposure : 72 h  
OCDE Ligne directrice 201 (Algues, Essai d'inhibition de la croissance)

### 12.1.2. Mixtures

The product has not been tested. The indication is based on the properties of the different components.

### 12.2. Persistence and degradability

Slightly degradable product.

#### 12.2.1. Substances

COBALT OXIDE (CAS: 1307-96-6)

Biodegradability : no degradability data is available, the substance is considered as not degrading quickly.

MOLYBDENUM TRIOXIDE (CAS: 1313-27-5)

Biodegradability : no degradability data is available, the substance is considered as not degrading quickly.

ALUMINIUM OXIDE (CAS: 1344-28-1)

Biodegradability : no degradability data is available, the substance is considered as not degrading quickly.

### 12.3. Bioaccumulative potential

no data

### 12.4. Mobility in soil

Partly dissolves, but significant proportion will remain. If product enters soil, one or more constituents will be mobile and may contaminate groundwater.

### 12.5. Results of PBT and vPvB assessment

Complies with annexe XIII of regulation CE 1907/2006 (REACH): not applicable to inorganic substances.

### 12.6. Other adverse effects

No data available.

## SECTION 13 : DISPOSAL CONSIDERATIONS

Proper waste management of the mixture and/or its container must be determined in accordance with Directive 2008/98/EC. Unused material may be incinerated or landfilled in facilities meeting local regulations.

### 13.1. Waste treatment methods

Do not pour into drains or waterways.

#### INFORMATION ON EXPOSURE SCENARIOS

- Treatment of waste:

Incineration by authorised units or controlled dumping.

Annual fraction of waste between 0.001 and 0.1%

- Sludge treatment:

Metal recovery organisations

#### Waste :

Waste management is carried out without endangering human health, without harming the environment and, in particular without risk to water, air, soil, plants or animals.

Recycle or dispose of waste in compliance with current legislation, preferably via a certified collector or company.

Do not contaminate the ground or water with waste, do not dispose of waste into the environment.

The exhausted catalysts may have different risks and properties compared to the original product. This safety data sheet is not applicable to exhausted catalysts.

#### Soiled packaging :

Empty container completely. Keep label(s) on container.

Empty containers should be taken to local recyclers for disposal. Refer to local regulations.

**Codes of wastes (Decision 2001/573/EC, Directive 2006/12/EEC, Directive 94/31/EEC on hazardous waste) :**

16 03 03 \* inorganic wastes containing dangerous substances

**SECTION 14 : TRANSPORT INFORMATION**

Transport product in compliance with provisions of the ADR for road, RID for rail, IMDG for sea and ICAO/IATA for air transport (ADR 2013 - IMDG 2012 - ICAO/IATA 2013).

**14.1. UN number**

3077

**14.2. UN proper shipping name**

UN3077=ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.  
(cobalt oxide)

**14.3. Transport hazard class(es)**

- Classification :



9

**14.4. Packing group**

III

**14.5. Environmental hazards**

- Environmentally hazardous material :

**14.6. Special precautions for user**

ADR/RID	Class	Code	Pack gr.	Label	Ident.	LQ	Provis.	EQ	Cat.	Tunnel
	9	M7	III	9	90	5 kg	274 335 601	E1	3	E
IMDG	Class	2°Label	Pack gr.	LQ	EMS	Provis.	EQ			
	9	-	III	5 kg	F-A,S-F	274 335	E1			
IATA	Class	2°Label	Pack gr.	Passager	Passager	Cargo	Cargo	note	EQ	
	9	-	III	956	400 kg	956	400 kg	A97 A158 A179	E1	
	9	-	III	Y956	30 kg G	-	-	A97 A158 A179	E1	

For limited quantities, see part 2.7 of the OACI/IATA and chapter 3.4 of the ADR and IMDG.

For excepted quantities, see part 2.6 of the OACI/IATA and chapter 3.5 of the ADR and IMDG.

**14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**

No data available.

**SECTION 15 : REGULATORY INFORMATION****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****- Classification and labelling information included in section 2:**

The following regulations have been used:

- Directive 67/548/EEC and its adaptations
- Directive 1999/45/EC and its adaptations
- Regulation EC 1272/2008 modified by regulation EC 618/2012

**- Container information:**

No data available.

**- Particular provisions :**

No data available.

**15.2. Chemical safety assessment**

No data available.

**SECTION 16 : OTHER INFORMATION**

Since the user's working conditions are not known by us, the information supplied on this safety data sheet is based on our current level of knowledge and on national and community regulations.

The mixture must not be used for other uses than those specified in section 1 without having first obtained written handling instructions.

It is at all times the responsibility of the user to take all necessary measures to comply with legal requirements and local regulations.

The information in this safety data sheet must be regarded as a description of the safety requirements relating to the mixture and not as a guarantee of the properties thereof.

**In compliance with directives 67/548/EEC, 1999/45/EC and their amendments.**

Hazard symbols :



Harmful



Dangerous for the environment

Contains :

EC 215-154-6

COBALT OXIDE

EC 215-204-7

MOLYBDENUM TRIOXIDE

Risk phrase :

R 50/53

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

R 43

May cause sensitisation by skin contact.

R 40

Limited evidence of a carcinogenic effect.

Safety phrase :

S 36/37

Wear suitable protective clothing and gloves.

S 61

Avoid release to the environment. Refer to special instructions/Safety data sheets.

S 22

Do not breathe dust.

S 60

This material and its container must be disposed of as hazardous waste.

S 57

Use appropriate container to avoid environmental contamination.

**Title for H, EUH and R indications mentioned in section 3 :**

H302	Harmful if swallowed.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer .
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
R 22	Harmful if swallowed.
R 36/37	Irritating to eyes and respiratory system.
R 40.C3	Limited evidence of a carcinogenic effect.
R 43	May cause sensitisation by skin contact.
R 50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Abbreviations :**

DNEL : Derived No-Effect Level

PNEC : Predicted No-Effect Concentration

CMR: Carcinogenic, mutagenic or reprotoxic.

ADR : European agreement concerning the international carriage of dangerous goods by Road.

IMDG : International Maritime Dangerous Goods.

IATA : International Air Transport Association.

ICAO : International Civil Aviation Organisation

RID : Regulations concerning the International carriage of Dangerous goods by rail.

WGK : Wassergefährdungsklasse (Water Hazard Class).

GHS07 : Exclamation mark

GHS08 : Health hazard

GHS09 : Environment

PROC : Process Category

ERC : Environmental Release Category

PC : Market sector by type of Chemical Product

SU : Sector of end Use

INFORMATION ON EXPOSURE SCENARIOS

- Abbreviations:

ES1: Manufacture of catalysts

ES2: Industrial use of formed catalysts containing metal oxides

ES3: Industrial use of formed catalysts containing metal oxides for the production of catalysts containing other metal compounds

For more in-depth use of the exposure scenarios in this SDS (e.g. extrapolation) the full version is available upon request (available in English only)