



ID Card Doré

Version 4 July 2023

Notes:

- This ID card is used to support the substance sameness discussions and to describe the substance/group to the best of the members' knowledge.
- It also aims at grouping communications relevant to the request of available data or information and the registration strategy
- It is the responsibility of each individual registrant to identify their substance and to report company-specific identity in their Registration Dossier (section 1 of IUCLID).

DISCLAIMER

The proper identification and characterisation of a substance or intermediate is the responsibility of each registering legal entity.

All data and information contained in this document shall be treated by the receiving party (i) in full confidence with the adequate respect of any confidential and/or proprietary nature of such information and (ii) only in the framework of the purpose of agreeing on substance sameness, Lead Registrant and overall REACH Strategy for the concerned Substance under REACH (the 'Purpose').

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1. Identification of the group

Table 1. Identification of the group

	Original (in EC inventory)
Name	Doré
EC number	273-793-6
CAS number	69029-47-6
Description	Gold and silver bullion
* EPMF Description	Metallic bars/ingots, grains or anodes and their residues (spent anodes) resulting from pyro-metallurgy processes applied on primary and secondary feeds with high precious metal content. Doré mainly contains silver and/or gold and copper, lower quantities of platinum group metals (iridium, osmium, palladium, platinum, rhodium, and ruthenium) and other non-ferrous metals.
Composition type	UVCB

* The description has been further detailed by EPMF in the registration dossier IUCLID Reference substance record (Description field) and in the CSR.

2. Synonyms and other identifiers of the group

- Doré bars
- Doré alloys
- Precious metal rich bullion

3. Substances (with core identifiers) also falling under this group (with justification)

Table 2. Substances also falling under this group

Name	EC number	CAS number	Description (EC inventory)
Residues, silver-refining	308-309-5	97926-88-0	Product resulting from the smelting, refining and/or use of silver and its alloys obtained from primary and secondary sources and including recycled plant intermediates. It consists primarily of silver and may contain other residual non-ferrous metals and their compounds.
Black metal, copper electrolytic slime smelting	266-974-6	67711-97-1	Slimes from electrolytic cells are smelted in a cupel, producing 'black' metal and a slag. The 'black' metal contains silver as a major constituent with significant amounts of tellurium and selenium and minor amounts of copper, gold and other metals.

N.B.: No registration dossier will be prepared by the EPMF for the materials listed in the above table. EPMF Members are recommended to register their material using the identifiers provided in Table 1, for which a dossier will be prepared by the EPMF.

Because of its generic name, "Residues, silver refining" in Table 2 above has been used to pre-register many different materials under REACH. Only those materials that are of metallic nature and have a composition similar to the one described below can be considered to be the same as Doré.

4. Boundary composition of the substance

Table 3. Typical composition

Element	Typical concentration (%)	Minimum concentration (%)	Maximum concentration (%)	Species
Silver	90.65	63.00	99.80	Metallic
Gold	2.07	0.07	5.10	Metallic
Iridium	0.00	0.00	0.10	
Palladium	0.62	0.00	2.00	
Platinum	0.28	0.00	1.50	
Rhodium	0.01	0.00	0.10	
Ruthenium	0.28	0.00	2.30	
Antimony	0.04	0.00	0.31	Metallic, oxide ^{\$}
Arsenic	0.01	0.00	0.25	Metallic, oxide ^{\$}
Bismuth	0.09	0.00	0.54	
Cadmium	0.00	0.00	0.05	
Copper	2.61	0.30	9.00	mainly metallic ^{\$}
Lead	0.09	0.00	3.00	Metallic ^{\$}
Nickel	0.00	0.00	0.03	Metallic ^{\$}



Selenium	0.43	0.00	2.50	Metallic ^{\$}
Tin	0.04	0.00	0.29	
Tellurium	2.91	0.00	25.00	Metallic ^{\$}
Elemental composition total: 100.2%				
Species	Typical concentration (%)	Minimum concentration (%)	Maximum concentration (%)	
metallic silver	63.00	99.80	90.70	
precious metals other than silver - metallic	0.10	11.00	3.30	
base metals - intermetallic species ^{\$}	0.30	25.00	6.00	^{\$} analytical reports show that metallic silver encloses the other Cu/Se/Te/Pb compounds. Therefore these intermetallic species are considered as inclusion and not as available compounds.
Mineralogical composition total: 100%				

Species were determined based on mineralogical analysis (by means of XRD analysis) and/or information available to registrants.

The composition given above represents the usual elemental/compound content available to the Members of the EPMF by July 2023. This usual content represents the majority of the Doré that is placed on the EEA market, which may also carry incorporated drosses and residues in the form of impurities.

In a UVCB substance, the number of constituents is relatively large and/or; the composition is, to a significant part, unknown and/or; the variability of composition is relatively large or poorly predictable. Hence, concentration ranges outside the ones given above do not exclude sameness and are usually referred to as unusual or exceptional situations. Each potential registrant is responsible for performing its own composition analysis.

5. Substance identity profile (SIP) of the substance

Substance Name Doré		Substance Information Page http://echa.europa.eu/brief-profile/-/briefprofile/100.067.065			Legend	Decisive substance sameness criterion
						Indicative substance sameness criterion
Substance description:		Metallic bars/ingots, grains or anodes and their residues (spent anodes) resulting from smelting processes applied on primary and secondary feeds with high silver content. Doré mainly contains metallic silver, smaller quantities of gold and various enclosed base metals compounds (mainly Cu, Te, Se, Pb).				No substance sameness criterion
Substance Identity	EC/list name:	Doré		SMILES:	not applicable	
	IUPAC name:	Gold and silver bullion		InChI:	not applicable	
	Other names	Doré bars, Doré alloys, precious metal rich bullion, metal Doré		Type of substance:	UVCB	
	EC/list no.:	273-793-6		origin:	Inorganic	
	CAS no.:	69029-47-6				
	Molecular formula:	not applicable		Substance listed		
SID parameters						
Sameness criteria					Indication of variability (fixed, low or high variation)	
Sources (input materials)	Silver rich sources (anode slimes from copper electro-refining, precious metals enriched alloy from lead refining, leach residues and crude metal from zinc and lead production, returns and sweeps from silver production (such as dust from bag filters, slimes from wet dedusting systems, silver cement obtained from spent silver electrolyte, slags, crushed refractory) and other silver-rich materials and/or scrap)				medium variability	
Process	Smelting in a furnace with fluxes to maximise separation/refining of metallic silver. The process results in a melt that is separated into metallic phase (Doré) and slag phase.				low variability	
Elemental composition	Core	min (% w/w)	max (% w/w)	Typical (%w/w)		
	Silver	63.0	99.8	90.7	low variability	
	Gold	0.1	5.1	2.1	low variability	
	PGM	0.0	6.0	1.2	low variability	
	Copper	0.3	9.0	2.6	low variability	
	Tellurium	0.0	25.0	2.9	medium variability	
	Selenium	0.0	2.5	0.4	low variability	
	Lead	0.0	3.0	0.1	low variability	
	Sum=				100.0	
Mineralogical composition	Metallic silver	63.0	99.8	90.7	low variability	
	Sum=				90.7	
Physical characteristics	physical state (at 20°C, 1013 hPa)	Solid massive form with grey to dark grey colour			fixed	
Conclusion	Doré is a solid grey massive form and is the enriched phase from smelting processes applied on feeds with high silver content. Doré is composed primarily of metallic silver and may contain other intermetallic phases (mainly Cu, Te, Se, Pb).					

The substance identity profile (SIP) outlines the main substance identifier/qualifiers relevant for substance identity. It reports sameness information on physical state (solid, liquid, gas), physical form (massive, powder), source, process descriptions and composition. Parameters are given a color code depicting importance for substance sameness. Dark green for decisive/fixed/low variability identity criteria, light green for indicative parameters that support the substance identity but are less well defined and/or characterized by medium variability, and white for parameters not relevant for substance identity.

6. Information on appearance, physical state and properties of the substance

Table 4. Appearance / physical state / properties of the substance

Physical state	Solid
Appearance	Grey to dark grey
Particle size*	Massive object

* Nanoform: particles in the size range 1 - 100 nm (for full definition of a nanomaterial, see <http://ec.europa.eu/environment/chemicals/nanotech/index.htm#definition>). Fine powder: particles in the size range 100 – 2.500 nm. Coarse powder: particles in the size range 2.500 nm – 1 mm. Massive object: particles in the size range > 1 mm.

7. Analytical data

Annex VI of REACH requires the registrant to describe the analytical methods and/or to provide the bibliographical references for the methods used for identification of the substance and, where appropriate, for the identification of impurities and additives. This information should be sufficient to allow the methods to be reproduced.

In addition to analytical data, registrants can use expert judgment and process knowledge to characterize their substance.

Table 5. Analytical methods for identification of the substance

Parameter / Method	Recommended for substance identification and sameness check	Applicable	Not applicable or not recommended
Elemental analysis			
ICP (ICP-MS or ICP-OES)	X		
Atomic absorption spectroscopy (AAS)			
Glow discharge mass spectrometry (GDMS)			
Molecular analysis			
Infrared (IR) spectroscopy			
Raman spectroscopy			
Mineralogical analysis			
X-Ray Fluorescence (XRF)			
X-Ray Diffraction (XRD)	X		
Morphology and particle sizing			
Optical microscopy and electron microscopy (SEM, TEM, REM)* #	X		
Laser diffraction* #	X		
Particle size by other means (e.g. sieve analysis)#			
Surface area by N-BET* #			
Other			
Magnetite analyser		X	
S/C analyzer		X	
Separation technique: ion exchange chromatography		X	

* Analytical techniques particularly (but not exclusively) relevant for nanomaterials.

The choice of the technique for particle size depends on the size of the material as manufactured/imported/placed on the market/used.



8. Lead Registrant

Aurubis AG (Germany) is the Lead Registrant for this intermediate. The European Precious Metals Federation (EPMF) will provide support to the Lead Registrant as laid down in the EPMF Agreement.

9. Scope of the Registration Dossier

All UVCB precious metal Refinables have only uses as an intermediate. Moreover, UVCB exposure scenarios are developed on a company / site-specific basis.