

Lead Dross, Bismuth Rich

Substance Name:	Substance Information Page: https://echa.europa.eu/registration-dossier/-/registered-dossier/14687	Legend	Decisive substance sameness criterion
Lead, dross bismuth rich			Indicative substance sameness criterion
Substance description:	EC description: A scum formed on the surface of molten lead during the process of removing bismuth by the addition of calcium and magnesium. It consists of lead containing calcium and magnesium bismuthides.		No substance sameness criterion
Original / SIEF description:	Lead, dross bismuth rich is formed when calcium and/or magnesium are added to molten lead bullion to remove bismuth. Lead dross, bismuth rich consists of variable amounts of lead, zinc, silver, bismuth and other metals in either alloy form or as compounds such as oxides.		

Substance Identity	EC/list name:	Lead, dross, bismuth rich	SMILES:	not applicable
	IUPAC name:		InChI:	not applicable
	Other names:		Type of substance:	UVCB
	EC/List no.:	273-792-0	origin:	Inorganic
	CAS no.:	69029-46-5		
	Molecular formula:	not applicable	Substance listed	

SID parameters	Sameness criteria	Indication of variability (fixed, low or high variation)
Sources (input materials)	The main starting material is lead, bullion (EC 308-011-5) typically from the primary sector but may include lead, bullion produced from non-battery scrap and other secondary sources. The lead, bullion starting material has usually been desilverised via the Parkes Process and dezincised by vacuum distillation, as required; calcium and/or magnesium are added to the molten lead bullion bath.	Low
Process	The manufacture of 'lead, dross, bismuth rich' relies on the formation of high melting point intermetallic compounds which have lower density than lead via the Kroll-Betterton process in a refining kettle. Process temperature ranges from 300 - 500°C. The process is detailed in Chapter 5 of the NFM BREF. Separation: Calcium-magnesium-bismuth intermetallic compounds formed as dross on the surface of the lead are removed by skimming. Post-treatment: The skimmed dross is then oxidised using lead chloride, chlorine gas, or a mixture of caustic soda and sodium nitrate, and the calcium and magnesium oxide is removed by skimming. A bismuth-lead alloy is recovered and undergoes further refining to produce bismuth.	Fixed

Elemental composition	Core	min (% w/w)	max (% w/w)	Typical (%w/w)	
	Lead	Minimum 22%		87	High
	Bismuth	0.2	41	15	Medium
	Magnesium	0	25	9	Medium
	Calcium	0	14	6	Low
	Sodium	0	14	13.5	Low
	Antimony	0	5	2.75	Low
	Zinc	0	2	1.79	Low
	Iron	0	1	0.54	Low
	Silicon	0	0.5	0.5	Low
	Sulphur	0	0.5	0.5	Low
	Arsenic	0	0.5	0.38	Low
	Copper	0	0.5	0.22	Low
	Potassium	0	0.2	0.127	Low
	Aluminium	0	0.5	0.1	Low
	Tellurium	0	0.5	0.021	Low
	Silver	0	1	0.011	Low
	Tin	0	0.2	0.008	Low
	Other constituents			<0.1% each	Low
	Sum=			137.447	

Mineralogical composition			
Lead-Calcium-magnesium-Bismuth-intermetallic compounds			
Metal oxides			
Sum=			0

Physical characteristics		
physical state (at 20°C, 1013 hPa)	Solid in massive form (coarse chunks)	Fixed
colour	Metallic grey/brown	Low

Conclusion	Lead, dross, bismuth rich' is a solid in massive form (coarse chunks) at 20°C, 1013 hPa. It is manufactured by the addition of calcium and magnesium to the molten lead bullion bath, via the Kroll-Betterton process. 'Lead, dross, bismuth rich' is generally oxidic but may also contain metallic/intermetallic forms.
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