BASE METALS REFINERY

IMPALA SPRINGS

SAFETY DATA SHEET – COBALT POWDER

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1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product *name Cobalt Powder

Synonym(s) Cobalt Metal Powder, Impala Cobalt Powder, Cobalt ACGIH OSHA, Cobalt Metallic, Cobalt – 59, Kobalt (German), Super Cobalt.

1.2 Uses and uses advised against

Use(s) Process Reagent, Industrial Applications, Paint Additive, alloy manufacturer, flame spraying.

1.3 Details of the supplier of the safety data sheet

Supplier name Impala Platinum Ltd – Refineries

Address
Base Metals Refinery
P.O. Box 222
SPRINGS
1560
GAUTENG
Republic of South Africa

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1.4 Emergency Contact telephone number(s)

For emergency information – see above for Impala Platinum contacts.
South Africa Poisons Information Centre: (24 hours): 0861 555 777 (South Africa only)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SANS 10234

GHS Classification(s)

Acute toxicity, oral:	Category 4
Respiratory sensitisation:	Category 1
Skin sensitisation:	Category 1
Aquatic toxicity:	Category 4

2.2 Label Elements:

Signal Word DANGER

Hazard Pictograms

Health Statement(s)	H301	Harmful if swallowed
	H317	May cause an allergic skin reaction
	H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
	H413	May cause long lasting harmful effects to aquatic life
Prevention statement(s)	P201	Obtain special instruction before use
	P202	Do not handle until all safety precautions have been read and understood
	P261	Avoid breathing dust/fume
	P264	Wash thoroughly after handling
	P270	Do not eat, drink or smoke when using this product
	P272	Contaminated work clothes must not be allowed out of the work place
	P273	Avoid release to the environment
	P280	Wear protective clothing, eye protection
	P285	In case of inadequate ventilation wear respiratory protection
Response statement(s)	P330	Rinse mouth
	P363	Wash contaminated clothing before reuse
	P101 + P312	IF SWALLOWED: Call a poison centre/doctor
	P302 + P352	IF ON SKIN: Wash well with plenty of soap and water
	P308 + P313	If exposed or concerned get medical advice/attention
	P304 + P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
	P342 + P311	If experiencing respiratory symptoms call a poison centre or doctor
	P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
	P337 + P313	If eye irritation persists get medical advice/attention
	P333 + P313	If skin irritation or rash occurs get medical advice/attention
Storage statement(s)	P405	Stored locked up
	P403 + P233	Store in a well ventilated place. Keep container tightly closed
Disposal statement(s)	P501	Dispose of contents/container in accordance with local/ regional/national/international regulations

2.3 **Other Hazards**:
No information provided

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 **Substances/Mixtures**

Ingredient	Cobalt
Formula	Co
CAS #	7440-48-4
Poison Schedule	None Allocated
Conc.	≥99.80%
RTECS#	GF 8750000
EC#	231-158-0
ICSC#	0782

4. FIRST AID MEASURES

4.1 **Description of first aid measures**

Eye Flush gently with running water for minimum 15 minutes. Seek medical attention if irritation develops. Keep patient calm

Inhalation If over exposure occurs leave exposure area immediately. If other than minor symptoms are displayed seek immediate medical attention. Apply artificial respiration if not breathing.

Skin Remove contaminated clothing and gently flush affected areas with running water. Seek medical attention if irritation develops. Launder clothing before reuse. Maintain good personal hygiene standards.

Ingestion If poisoning occurs, contact a Doctor or Poisonous Information Centre (24 hours) 0861 555 777 (South Africa only). Do not induce vomiting. Seek immediate medical attention.

First Aid Facilities Eye wash and safety shower facilities should be available.

4.2 Most important symptoms and effects, both acute and delayed

May cause an allergic skin reaction. May cause allergy or asthma or breathing difficulties if inhaled.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media

Use an extinguishing agent suitable for a surrounding fire.

5.2 Special hazards arising from the substance or mixture

Non-flammable. Very fine dust (<3um) may burn when exposed to ignition sources or mixed with strong oxidising agent. May evolve toxic cobalt oxides when heated. May evolve explosive hydrogen gas on contact with water / acid.

5.3 Advice for firefighters

Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment (see spillage section 6.1 below) including Self Contained Breathing Apparatus (SCBA) when combating fire. Use water fog to cool intact containers and nearby storage areas.

5.4 Hazardous Chemical Code

None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear PPE as detailed in section 8 of this SDS.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, and collect and place in suitable containers for disposal. Avoid generating dust.

6.4 References to other sections

See sections 8 and 13 for exposure controls and disposal

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use, read the product label. Use of safe work procedures are recommended, to avoid eye or skin contact and inhalation. Observe good personal hygiene. Prohibit eating, drinking and smoking in contaminated areas. Wash hands before eating.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool, dry, well ventilated area, removed from oxidising agents, alkalis, acids and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.

7.3 Specific end use(s)

Packed in blue 250kg drums, loaded in 1000kg lots on a pallet, sealed with a numbered plastic seal and lead seal. No other information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

OHS Act South Africa	-	0.1mg/m^3
TLV / TWA:ACGIH	-	0.02mg/m^3
TWA ASCC (AUS)	-	0.05mg/m^3 metal dust and fume (as Co)
UK EH40 WELs TWA	-	0.1mg/m^3
PEL (USA)	-	0.01mg/m^3 metal dust and fume (as Co)
REL (USA)	-	0.05mg/m^3 metal dust and fume (as Co)
TLV (USA)	-	0.02mg/m^3 BEI (as Co)
EL (Canada)	-	0.02mg/m^3 IARC 2B
EV (Canada)	-	0.1mg/m^3

Biological Limits

Reference	Determinant	Sampling Time	BEI
ACGIH BEI	Cobalt in urine	End of shift at end of work week	15 mg/L
ACGIH BEI	Cobalt in blood	End of shift at end of work week	1 mg/L

8.2 Exposure Controls

Engineering controls Do not inhale dust / powder. Use with adequate natural ventilation. Where a dust inhalation hazard exists, mechanical extraction ventilation is recommended. Maintain dust / fume levels below the recommended exposure standard.

PPE

Eye Wear dust-proof goggles

Hand Wear PVC or rubber gloves.

Body Wear overalls. Do not take working clothes home.

Respiratory Where an inhalation risk exists, wear a Class P2 (Particulate) respirator. At high dust levels, wear a Full-Face Class P3 (Particulate) or Powered Air Purifying Respirator (PAPR).

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	:	Grey metallic powder
Physical state	:	Solid
Odour	:	Odourless
Odour threshold	:	Not applicable
Flash Point	:	Not Applicable
Boiling Point	:	2927ºC (5300.6°F)
Melting Point	:	1495ºC (2719.4°F)

Exposure Standard (TWA)	:	0.02 mg/m^3 (cobalt)
Evaporation Rate	:	Not Available
pH	:	Not applicable
% Volatiles	:	Not Available
Specific Gravity	:	8.92
Vapour Pressure	:	Not applicable
Solubility (water)	:	Insoluble
Flammability	:	Non Flammable
Lower Explosion Limit	:	Not applicable
Upper Explosion Limit	:	Not applicable
Auto-ignition temperature	:	Not available
Decomposition temperature	:	Not available
Viscosity	:	Not applicable
Viscosity temperature	:	Not applicable
Molecular Weight	:	58.93g/mole
Co concentration	:	>=99.80%

9.2 **Other information**

No other information available.

10. STABILITY AND REACTIVITY

10.1 **Reactivity**

Carefully review all information in sections 10.2 to 10.6.

10.2 **Chemical stability**

Stable under recommended conditions of storage

10.3 **Possibility of hazardous reactions**

No reactions expected, except if exposed to incompatible materials – see section 10.5

10.4 **Conditions to avoid**

Avoid heat, sparks, open flames and other ignition sources (fine particles, <3um, can combust when exposed to ignition sources), as well as incompatible materials (section 10.5)

10.5 **Incompatible materials**

Incompatible violently/explosively with strong oxidising agents (e.g. peroxides ammonium nitrate, bromine tetrafluoride and nitryl fluoride.) Attacked slowly by ammonia and sodium hydroxide. Incompatible with reactive metals (e.g. potassium and sodium) and with acids (e.g. hydrochloric acid). May spontaneously ignite on contact with air or acetylene in finely ground form. May evolve EXPLOSIVE hydrogen gas on contact with water/acids.

10.6 **Hazardous decomposition products**

May evolve toxic cobalt oxides when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 **Information on toxicological effects**

Acute Toxicity	LDLo (Ingestion)	:	750mg/kg (rabbit)
	LDLo (Intraperitoneal)	:	100mg/kg (mouse)
	LDLo (Intravenous)	:	100mg/kg (mouse)
	LD50 (Ingestion)	:	6170mg/kg (rat)
	LD50 (Intaperitoneal)	:	100mg/kg (rat)

Skin Irritant. Cobalt has been reported to cause dermatitis and skin sensitisation. Chronic over exposure may result in “Cobalt itch” or “carboloy-itch” (“measle like” red spotty rash). Prolonged and repeated contact may result in skin rash, dermatitis and hypersensitivity with allergic response.

Eye	Irritant. Contact may result in irritation, lacrimation, pain, redness and conjunctivitis. Prolonged contact may cause corneal burns and possible permanent damage.
Mutagenicity	Insufficient data available to classify as a mutagen. Cobalt salts (not metal) have been reported to cause chromosomal damage in experimental animals.
Carcinogenicity	Cobalt and cobalt compounds may cause cancer to humans (IARC Group 2B).
Reproductive	Insufficient data available to classify as a reproductive toxin.
STOT – SE	Irritant. Over exposure to cobalt has been reported to cause respiratory sensitisation, with asthma like symptoms. Over exposure may result in upper respiratory and mucous membrane irritation, coughing and, at high levels, breathing difficulties with asthma like symptoms, with wheezing and shortness of breath. Potential respiratory sensitiser. Chronic exposure may result in lung fibrosis, hypersensitivity and asthma. DEAFNESS: Bilateral nerve deafness has been described following chronic occupational exposure to cobalt powder or during chronic treatment of anaemia with cobalt chloride. Deafness typically resolves completely after discontinuation of exposure (Gardner, 1953; Schirmacher, 1967; Meecham & Humphrey, 1991). RHINITIS: Rhinitis has been described in diamond polishers with exposure to fine cobalt dust and symptoms of bronchoconstriction (Gheysens et al, 1985). Metallic cobalt may be retained in and slowly absorbed from the lungs, with an estimated half-life of 5 to 15 years (HSDB).
STOT - RE	Low to moderate toxicity. Ingestion may result in nausea, vomiting, abdominal pain, diarrhoea, fatigue, dizziness and drowsiness, and with large doses unconsciousness. Ingestion of cobalt salts may cause reproductive effects. Thyroid damage, liver and kidney damage and heart failure may occur.
Aspiration	This product does not present an aspiration hazard.
Sensitisation	Sufficient data from human studies exists to warrant classification of cobalt as a dermal sensitiser via skin contact, and a respiratory sensitiser via inhalation

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Only if reacted with acids under specially applied conditions.
Limited eco toxicity data was available for this product at the time this report was prepared. Ensure appropriate measures are taken to prevent this product from entering the environment and reacting with strong acids.

Cobalt is absorbed to a great extent by hydrolysis or oxidate sediments. Cobalt may be taken into solution in small amounts through bacteriological activity.

12.2 Persistence and degradability

No information available.

12.3 Bio accumulative potential

No information available.

12.4 Mobility in soil

The availability of cobalt is primarily regulated by pH and is usually found in soils as divalent cobalt. At low pH it is oxidised to trivalent cobalt and often found associated with iron. Adsorption of divalent cobalt on soil colloids is high between pH 6 & 7, whereas leaching and plant uptake of cobalt are enhanced by a lower pH (HSDB).

12.5 **Results of PBT and vPvB assessment**
No information available.

12.6 **Other adverse effects**
No information available.

13. DISPOSAL CONSIDERATION

13.1 **Waste treatment methods**

Waste Disposal Collect and reuse where possible. Minimise dust generation. Contact Impala Refineries for additional specific information (section 1.3).

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG, IMDG OR IATA

		Land Transport (ADG)	Sea Transport (IMDG/IMO)	Air Transport (IATA/ICAO)
14.1	UN #	None Allocated	None Allocated	None Allocated
14.2	UN proper shipping name	None Allocated	None Allocated	None Allocated
14.3	Transport hazard class			
	D.G Class	None Allocated	None Allocated	None Allocated
	Subsidiary risk(s)	None Allocated	None Allocated	None Allocated
14.4	Packing Group	None Allocated	None Allocated	None Allocated
14.5	Environmental hazards	None Allocated	None Allocated	None Allocated
14.6	Special precautions for user			
	Hazchem code	None Allocated	None Allocated	None Allocated

15. REGULATORY INFORMATION

15.1 **Safety, health and environmental regulations/legislation specific for the substance or mixture**

Poison schedule A poison schedule number has not been allocated to this product.

Classifications
N : Dangerous for the environment.
Xi : Irritant

Risk phrases
R22 : Harmful if swallowed
R37 : Irritating to respiratory system
R42/43: May cause sensitisation by inhalation or skin contact
R48/23 : Toxic. Danger of serious damage to health by prolonged exposure through inhalation
R49 : May cause cancer by inhalation
R53: May cause long term adverse effects in the aquatic environment

Safety phrases
S2 : Keep out of reach of children
S22 : Do not breathe dust
S24 : Avoid contact with skin
S36/37/39 : Wear suitable protective clothing, gloves, eye protection
S61 : Avoid release to the environment

Regulatory information
SA Hazardous Substances Act 15/1973
SANS 10228:2012 SA National Standard – The identification and classification of dangerous goods for transportation by road and rail modes

GHS of Classification and Labelling of Chemicals ST/SG/AC.10/3-/Rev.6

Regulation (EC) No. 1907/2006 of the European Parliament and the Council of December 2006

15.2 Chemical safety assessment
No other information available

16. OTHER INFORMATION

Additional information

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

EXPOSURE STANDARDS – TIME WEIGHTED AVERAGES: Exposure standards are established on the premise of an 8 hour work period of normal intensity, under normal climatic conditions and where a 16 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced; strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).

HEALTH EFFECTS FROM EXPOSURE: It should be noted that the effects from exposure to this will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which encompasses all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES: The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

COLOUR RATING SYSTEM: Amber. In accordance with Chem Alert reports are assigned a colour rating of Green, Amber or Red for the purpose of providing users with a quick and easy means of determining the hazardous nature of a product. Safe handling recommendations are provided in all Chem Alert reports so as to clearly identify how users can control the hazards and thereby reduce the risk (or likelihood) of adverse effects. As a general guideline a Green colour rating indicates a low hazard, and Amber colour rating indicates a moderate hazard and a Red colour indicates rating indicates a high hazard.

Whist all due care has been taken in the preparation of the Colour Rating System, it is intended as a guide only and does not provide any warranty in relation to the accuracy of the Colour Rating System. As far as is lawfully possible, Impala accepts no liability or responsibility whatsoever for the actions or omissions of any person in reliance on the Colour Rating System.

Abbreviations

ADG	European agreement on the International carriage of dangerous goods by road
AUS	Australia
mg/m^3	Milligrams per cubic metre
CAS#	Chemical Abstract Service number – used to uniquely identify chemical compounds
CNS	Central Nervous System
EC#	Enzyme commission
EU	European Union
GHS	Global Harmonized System of Classification and Labelling of Chemicals
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
ICSC	International Chemical Safety Card
IMDG	Inter Modal transport of Dangerous goods
IMO	International Maritime Organisation
M	Moles per litre, a unit of concentration
pH	Relates to hydrogen ion concentration - this value will relate to a scale of 0 – 14, where 0 is highly acidic and 14 is highly alkaline.
OEL	Occupational Exposure Limit
PPE	Personal Protective Equipment
Ppm	Parts per million
RTECS	The Registry of Toxic Effects of Chemical Substances
STEL	Short Term Exposure Limit
STOT-RE	Specific Target Organ Toxicity – repeated exposure
STOT-SE	Specific Target Organ Toxicity – single exposure
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA/ES	Time Weighted Average of Exposure Standard

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