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| PAGE 1 of 7 | <p style="text-align: center;">PLATINUM METALS REFINERY</p>  |
| REVISION N ^o .: 1 | WORK PROCEDURE TASK: HAZARD DATA SHEET - IRIIDIUM |
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| | DOCUMENT N ^o .: HDS 019 |

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NOTE: Although this is a Quality controlled document, copies are readily available to all interested parties. No record is kept of copies issued but whenever a major update is carried out copies are sent to all Impala’s PGM customers. The current version is also available on the Implats website www.implats.co.za

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SAFETY DATA SHEET

PRODUCT NAME: IRIIDIUM POWDER

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identification of the preparation:
 Product name: Iridium powder Product code: IR METAL
 Chemical name: Iridium Formula: Ir
 Recommended uses: Manufacture of Iridium chemicals for use in catalysts, and electrode coatings, as metal or alloys for corrosion and heat resistant applications.
 Company Identification:
 Impala Platinum Limited – Refineries
 Corner East Geduld Road & Cowles Street
 P O Box 222, Springs 1560, South Africa
 Tel.: +27 (0)11 360 3111, Fax: +27 (0)11 360 3202
 www.implats.co.za jamie.welman@implats.co.za
 Emergency telephone no.: Impala Platinum Refineries +27 (0)11 360 3777
 Poison Centre - Tygerberg Hospital, Belville, Cape +27 (0)21 931 6129

2. HAZARD IDENTIFICATION

Low toxicity

WARNING

Harmful - if swallowed, - in contact with skin, - if inhaled
 The product may cause adverse health effects with high-level dust generation, inhalation or prolonged skin contact. May form Iridium salts on contact with acids.

Additional Labeling:
 Each container should be labeled as follows:
 Before use read Safety Data Sheet
 If dissolved, ensure adequate enclosure or ventilation; do not breathe mists and avoid solution contact with eyes, skin and clothing – may cause sensitization or allergic reaction
 If melted do not breathe furnace fumes



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| 3. COMPOSITION / INFORMATION ON INGREDIENTS | | |
|---|---------------|--------------------------|
| Major components: | Typical wt %: | CAS #: 7439-88-5 |
| Iridium | 99.90-99.99% | EINECS Number: 231-095-9 |

| 4. FIRST AID MEASURES |
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| <p>Inhalation: If over exposure occurs leave exposure area immediately. If other than minor symptoms are displayed seek immediate medical attention</p> <p>Ingestion: If poisoning occurs, contact a Doctor or Poisons Information Centre on +27-21-931-6129. Do not induce vomiting. Give a glass of water to drink. Seek urgent medical attention.</p> <p>Skin: Gently flush affected areas with soap and water. Seek medical attention if irritation develops.</p> <p>Eyes: Flush gently with running water for at least 15 minutes. Seek medical attention if irritation develops.</p> |

| 5. FIRE-FIGHTING MEASURES |
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| <p>Suitable extinguishing media: does not burn</p> <p>Extinguishing media not be used: not applicable</p> <p>Special exposure hazards: none</p> <p>Special protective equipment for fire-fighters: none</p> <p>NOTE: Unlike some finely divided Iridium powder supplied by other companies, the material supplied by Impala Platinum is non-flammable and therefore DOES NOT present a fire hazard.</p> |

| 6. ACCIDENTAL RELEASE MEASURES |
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| <p>Personal precautions: If spilt (bulk) wear goggles and PVC or rubber gloves. Where a dust inhalation hazard exists (i.e. when used in large quantities) wear a Class P1 (particulate) respirator.</p> <p>Environmental precautions: Prevent this material from entering into surface waters.</p> <p>Methods for cleaning-up: SOLID – sweep up and place in sealed container. SOLUTION - Absorb with moist sand or similar and place in sealed containers for reprocessing or recovery.</p> |

| 7. HANDLING AND STORAGE |
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| <p>Handling: Avoid inhalation of dust or fumes. Avoid contact with skin or eyes. Use local ventilation which is adequate to limit exposure to levels not exceeding occupational exposure limits. Activities generating dust should be avoided.</p> <p>Storage: Store in tightly sealed containers in a cool, dry and well-ventilated area removed from oxidizing agents, acids and foodstuffs. Ensure containers are adequately labeled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.</p> |

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| 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION |
| <p>Occupational Exposure Limit: (ACGIH, edition 1999)</p> <p>Exposure standard (TWA): 10mg/m³ (nuisance dust)</p> <p>Respiratory protection: Use an appropriate and approved respirator for toxic dust or fume if airborne concentration is likely to exceed the occupational exposure limits.</p> <p>Hand protection: Wear suitable gloves (PVC or rubber)</p> <p>Eye protection: Wear dust-proof goggles.</p> <p>Skin protection: Safety shoes, overalls or similar full-body work clothes should be worn and laundered daily. This protective clothing should not be worn at home.</p> <p>Personal Hygiene: Practice good housekeeping and personal hygiene procedures. No eating, drinking or smoking in work area. Wash hands thoroughly before eating, drinking or smoking. Avoid ingestion, inhalation and skin and eye contact. Medical examinations, monitoring, record keeping and hygiene facilities are recommended.</p> |

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| 9. PHYSICAL AND CHEMICAL PROPERTIES |
| <p>Appearance: Dark gray metallic powder</p> <p>Odour: Odourless</p> <p>pH: not applicable</p> <p>Boiling point / boiling range: 4428°C; 8002°F</p> <p>Melting point / melting range: 2466°C; 4471°F</p> <p>Flash point: not applicable</p> <p>Flammability (solid, gas): non-flammable</p> <p>Autoflammability: not applicable</p> <p>Explosive properties: not applicable</p> <p>Oxidizing properties: not applicable</p> <p>Vapour pressure: unknown</p> <p>Relative density: 2.1 - 2.8 (variable)</p> <p>Solubility : - hydrosolubility: insoluble in water liposolubility (solvent-oil): insoluble in solvent-oil</p> <p>Partition coefficient (n-octanol/water): not applicable</p> |

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| 10. STABILITY AND REACTIVITY |
| <p>The material is stable under normal circumstances</p> <p>Conditions to avoid: Exposure to high temperatures (> 1000°C), generation of dust.</p> <p>Incompatible materials: Avoid contact with acids or strong oxidizing agents.</p> <p>Hazardous decomposition products: Nil</p> |

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11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Ingestion: Iridium powder is non-toxic. May cause irritation of the gastro-intestinal tract.
Iridium salts may be more toxic e.g. Iridium (IV) chloride Rat, oral LD₅₀ 1560mg/kg

SKIN IRRITATION / CORROSION

Non-irritant: Low irritant. Prolonged and repeated exposure to dust/powder may result in irritation due to mechanical action. Possible sensitizer. Direct contact with Iridium salts may result in irritation and skin sensitization.

EYE DAMAGE / IRRITATION

Irritant: Exposure may result in eye irritation, lachrymation, burning sensation and conjunctivitis and possible corneal burns with prolonged contact.

RESPIRATORY OR SKIN SENSITIZATION

Non-irritant: Iridium metal is unlikely to cause irritation except as a dust. Iridium salts are irritating to eyes, skin and mucous membranes and may cause sensitization.

REPRODUCTIVE CELL MUTAGENICITY

The effects of Iridium salts have not been fully investigated.

CARCINOGENICITY

Non-carcinogenic: Iridium salts are listed as a non-carcinogenic in (all U.S.):
i) in the National Toxicity Program (NTP) Report on Carcinogens
ii) in the International Agency for Research on Cancer (IARC) monographs
iii) by the Occupational Safety and Health Administration (OSHA)
Water-soluble Iridium compounds have caused tumours in laboratory animals.

REPRODUCTIVE TOXICITY

Iridium chloride has caused mutations in bacteria and tumours in laboratory animals. However, the effects have not been fully investigated. Pregnant women should avoid contact with Iridium salts.

SPECIFIC TARGET ORGAN TOXICITY – Single exposure

Iridium salts may cause possible damage to the respiratory tract, GI tract, skin, eyes, teeth and immune system. However, the effects have not been fully investigated.

SPECIFIC TARGET ORGAN TOXICITY – Repeated exposure

Rhodium salts may cause possible damage to the respiratory tract, GI tract, skin, eyes, teeth and immune system. However, the effects have not been fully investigated.

ASPIRATION HAZARD

Inhalation : Low irritant. Inhalation of dusts may result in upper respiratory tract irritation. Iridium metal poses a low hazard but Iridium salts are potential irritants and sensitizers.

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| 12. ECOLOGICAL INFORMATION |
| <p>Due to the very low solubility of Iridium powder it does not directly pose any ecological threat. However, if converted to soluble Iridium salts it may have the following effects:</p> <p>Accumulation:</p> <ul style="list-style-type: none"> - Persistence: hazard of iridium persistency in the environment - Bioaccumulative potential: hazard of iridium accumulation - Biomagnification: potential hazard of iridium magnification - Biodegradability: no information available <p>Ecotoxicity:</p> <ul style="list-style-type: none"> - Aquatic organisms: Potentially toxic to aquatic organisms. May cause long term adverse effects in the aquatic environment. - Soil organisms: unknown; no information available - Plants and terrestrial animals: unknown; no information available <p>Other adverse effects:</p> <ul style="list-style-type: none"> - Ozone depletion potential: does not contain ozone depleting substances - Photochemical ozone creation potential: not applicable - Global warming potential: not applicable - Effects on waste water treatment plants: unknown; no information available <p>The environmental effects of Iridium and its compounds have not been fully evaluated.</p> |

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| 13. DISPOSAL CONSIDERATIONS |
| <p>Disposer must comply with state and local laws. This material can be metallurgically recycled by Impala Platinum, South Africa, which is a pre-authorized facility for the environmentally sound recovery of metals.</p> |

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| 14. TRANSPORT INFORMATION |
| <p>NOT REGULATED FOR TRANSPORT PURPOSES</p> <p>Packing : in plastic bottles sealed in tins which in turn are sealed in boxes</p> <p>UN-Nr.: not applicable</p> <p>IMDG-Code: not applicable</p> <p>ICAO / IATA : not applicable</p> <p>RID / ADR : not applicable</p> |

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| 15. REGULATORY INFORMATION |
| <p>United States: CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated</p> <p>Canada: WHMIS Classification: D2B (toxic material)</p> <p>EU/EC Classification: X_n (Harmful); not classified in Annex I of Directive 67/548/EEC (will change with implementation of GHS/REACH)</p> |

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| 16. OTHER INFORMATION : |
| <p>Hazard Information References :</p> <p>RTECS : Registry of toxic effects of Chemical Substances, NIOSH, edition January 1999</p> <p>Sax's Dangerous Properties of Industrial Materials (8th edition), R J Lewis Sr.</p> <p>Screening of Platinum Group Metals; Pt, Rh, Pd SWECO VIAK Screening Report 2007:2 (For Swedish Environmental Protection Agency)</p> <p>ECOTOX database; http://cfpub.epa.gov/ecotox</p> <p>The buyer assumes all risks with the use and handling of the material.</p> <p>The seller assumes no responsibility or liability in connection with the information supplied in this sheet or for any damage or injury caused by the material; reasonable safety procedures should be followed.</p> <p>The seller assumes no responsibility for injury or damage caused by use of the material even if reasonable safety procedures are followed. The information contained in this sheet is developed from what is believed to be accurate and reliable sources but the seller makes no warranties, either expressed or implied, and assumes no responsibility for the accuracy or completeness of the data contained herein.</p> |