

# High Grade Nickel Concentrate

## Product Information

High Grade Nickel Concentrate is used for the recovery of metal values.

Vale Canada Newfoundland and Labrador  
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Chemtrec 24 hr Emergency No. 1-800-424-9300 WHMIS Classification: D2B, Class E

## Hazardous Ingredients

Component	% wt	CAS No.	Exposure Limit (TLV) <sup>1 2</sup>	LD50 (oral, sp)
Chalcopyrite, CuFeS <sub>2</sub>	0.25-1.5	1308-56-1	1 mg/m <sup>3</sup> as Cu	Not available
Pentlandite (Ni, Fe) <sub>9</sub> S <sub>8</sub>	85-95	53809-86-2	0.2mg/m <sup>3</sup> as Ni *	Not available
Pyrrhotite Fe <sub>n-1</sub> S <sub>n</sub>	5-15	1310-50-5	Not available	Not available
Cobalt sulfide minerals	1-1.5	Not available	0.02 mg/m <sup>3</sup> as Co	Not available

\* - nickel in inhalable fraction

## Physical Data

Particle Size:	The 80% passing size of fresh High Grade Nickel Concentrate is expected to be 50µm based on pilot plant results range from 25 - 90 µm). The High Grade Nickel Concentrate is expected to age and oxidize during storage thus forming agglomerates and lumps.
Solubility in water:	Insoluble
pH:	11.5 - 12.0
Appearance in colour:	Odourless, blackish-gray, slurry or moist powder
Odour threshold (ppm):	Odourless
Corrosiveness to common metals:	Corrosive to aluminum and steel
Specific Gravity:	4.7 - 5.1g/cm <sup>3</sup>
Physical state:	Paste, typically as slurry or filter cake
Moisture:	Below bulk TML (threshold moisture limit) of 8.5%

Component	Boiling Point (°C)	Melting Point (°C)	Molecular wt	Specific Gravity
Chalcopyrite, CuFeS <sub>2</sub>	Not available	950	183.51	4.2
Pentlandite, (Ni, Fe) <sub>9</sub> S <sub>8</sub>	Not available	Not available	771.25	4.8
Pyrrhotite, Fe <sub>n-1</sub> Sn	Not available	Not available	646.6	4.6
Cobalt	2000	1495	58.9	8.9

## Fire or Explosion Hazard Data

Conditions of flammability: Non-flammable under normal conditions  
Fire and explosion hazards: Contains sulphides which when dry and exposed to excess heat may evolve sulphur dioxide

## Reactivity Data

Stability: Stable, hazardous polymerization will not occur  
Incompatibility: Many sulphides react violently and explosively with powerful oxidizers, evolving SO<sub>2</sub>  
Volatile products given off at room temperature: None  
Hazardous decomposition products: SO<sub>x</sub>  
Conditions to avoid: Heat, ignition sources.

## Toxicological Properties

### **Pentlandite:**

#### *Inhalation:*

The International Agency for Research on Cancer (IARC) concluded there was sufficient evidence that nickel compounds are carcinogenic to humans. Intratracheal instillation of pentlandite (>98% pure) in hamsters did not produce a significant increase in lung tumors. The pentlandite remained in the lung nine times longer than the positive control (Ni<sub>3</sub>S<sub>2</sub>), which also did not produce a significant increase in lung tumors.

### **Chalcopyrite:**

#### *Pre-existing conditions:*

Significant information specific to chalcopyrite was not found in the literature.

Wilson's disease can occur in certain individuals with a rare inherited metabolic disorder characterized by retention of excessive amounts of copper in the liver, brain, kidneys and corneas. These deposits eventually lead to tissue necrosis and fibrosis, causing a variety of clinical effects, especially liver (i.e. hepatic) disease and neurologic changes. Wilson's disease is progressive and, if left untreated, leads to fatal liver (i.e. hepatic) failure.

### **Pyrrhotite:**

An extensive literature search revealed no toxicological or health hazard information specific to this material.

### **Cobalt Sulfide:**

May cause shortness of breath, coughing, and sore throat. May cause irritation to skin a eyes.

## Preventative Measures

Steps to be taken if material is released or spilled:

Prevent spread of spill. Wet sweep or scoop up and reuse. Collection of spill material when dry may also be made by vacuuming or by wetting prior to sweeping, scooping, etc. Caution should be taken to avoid release into sewers or waterways.

Waste disposal method:	Wastes and spills are collected and recycled to recover metal values. Disposal does not occur.
Engineering Controls:	Use with adequate ventilation.
Eye protection:	Safety glasses
Hand protection:	Gloves - neoprene, butyl rubber, natural rubber or leather. Use of barrier cream is suggested.
Respirator type:	Under normal circumstances, respiratory protection is required. Under other circumstances of excess handling, departmental standards must be consulted.
Precautionary measures:	Wash hands thoroughly after handling.
Other storage conditions:	Keep in a moist condition if possible to avoid drying and to minimize dust generation. Controls should be taken to prevent self-heating and SO <sub>2</sub> emission; these controls include compaction of material, and keeping material moist.
Other handling conditions:	Wash before eating, smoking or eating. Avoid inhalation of dust.

## First Aid Measures

Skin contact:	For skin irritation, flush with plenty of water. For skin rashes, seek medical attention.
Eye contact:	Immediately flush with water for 15 minutes, holding eyelids open while flushing.
Inhalation:	For respiratory tract irritation, remove to fresh air. If symptoms persist, seek medical care.
Ingestion:	Get immediate medical attention.

## Preparation Information

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### **Note:**

**Vale Canada believes that the information in this Material Safety Data Sheet is accurate. However, Vale Canada makes no express or implied warranty as to the accuracy of such information and expressly disclaims any liability resulting from reliance on such information.**

### Footnotes:

1. Threshold Limit Value of the American Conference of Governmental Industrial Hygienists.
2. Exposure Limits for user operations will depend on the relevant governmental regulations.