

Pyrite

Safety Data Sheet

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : Pyrite

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Mining Product

1.3. Details of the supplier of the safety data sheet

Kyanite Mining Corporation
30 Willis Mountain Plant Lane
Dilwyn, VA 23936
T 434-983-4322

1.4. Emergency telephone number

434-983-2085

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Carc. 1A H350

Depending on the type of handling and use (e.g. grinding, drying), airborne respirable crystalline silica may be generated. Prolonged and/or massive inhalation of respirable crystalline silica dust may cause lung fibrosis, commonly referred to as silicosis. Principal symptoms of silicosis are cough and breathlessness. Occupational exposure to respirable crystalline silica dust should be monitored and controlled. This product should be handled with care to avoid dust generation.

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS08

Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H350 - May cause cancer

Precautionary statements (GHS-US) :

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P308 + P313 - If exposed or concerned: Get medical advice/attention
P405 - Store locked up
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS-US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification (GHS-US)
Pyrite (FeS ₂)	(CAS No) 1309-36-0	95 - 100	Not classified
Quartz	(CAS No) 14808-60-7	1 - 5	Acute Tox. 4 (Oral), H302 Carc. 1A, H350
Kyanite	(CAS No) 1302-76-7	< 1	Not classified
Silica, cristobalite	(CAS No) 14464-46-1	< 0.1	Carc. 1A, H350

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SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures after inhalation : If irritation occurs, remove to fresh air. If breathing problems occur, a certified professional should administer oxygen or artificial respiration as indicated and obtain immediate medical attention.
- First-aid measures after skin contact : Wash thoroughly with soap and water. If irritation persists, obtain medical attention.
- First-aid measures after eye contact : Dusts and particles may cause physical abrasion. Do not rub eyes. Rinse eyes with lukewarm water for at least 15 minutes. Open and close the eyelids during rinsing to remove all dusts and particles. If irritation persists, seek medical attention.
- First-aid measures after ingestion : None required for small amounts. If substantial quantities are ingested, give 4-8 ounces of water or milk to dilute and seek medical advice.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries after inhalation : Inhalation of high dust concentrations may cause coughing and mild irritation. Repeated inhalation of dusts containing crystalline silica over time can cause progressive fibrotic lung disease (silicosis) and increase the risks of developing respiratory cancer. Lung damage may progress even if the worker is removed from exposure. Silicosis can result in death from cardiac failure or the destruction of lung tissue. The extent and severity of lung damage depends on a variety of factors including particle size, percentage of silica, natural resistance, dust concentration, and length of exposure. Repeated inhalation of aluminum silicates may also cause milder lung fibrosis. Long term inhalation of iron may lead to relatively benign deposits or iron in the lung (siderosis).
- Symptoms/injuries after skin contact : Irritation is not expected.
- Symptoms/injuries after eye contact : Chemical irritation is not expected. Dusts and particles may scratch the eyes.
- Symptoms/injuries after ingestion : Not considered a likely route of exposure under normal product use conditions. May cause gastrointestinal irritation if swallowed. Product is relatively non-toxic.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Does not burn. Use extinguishing media appropriate for surrounding fire.
- Unsuitable extinguishing media : None.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : Not flammable.
- Explosion hazard : None known.
- Reactivity : None.

5.3. Advice for firefighters

- Protection during firefighting : Firefighters should wear full protective gear.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Avoid inhalation of dust from the spilled material. Do not walk through or scatter spilled material.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

- For containment : Stop the flow of material, if this is without risk.

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Methods for cleaning up : Use wet clean-up methods (wiping, mopping, etc.) or a vacuum to remove small amounts. The vacuum must be equipped with a filtration system sufficient to remove and prevent the recirculation of crystalline silica (a vacuum equipped with a high efficiency particulate air filter (HEPA) filter is recommended). For large spills, use a fine water spray or mist to control dust creation and carefully scoop or shovel into a clean, dry container for later reuse or disposal. Completely remove all dusts to prevent recirculation of crystalline silica into the workplace. **DO NOT USE DRY SWEEPING OR COMPRESSED AIR TO CLEAN SPILLS.** Clean-up personnel must wear appropriate protective equipment including respiratory protection (See Section 8).

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Plant processes should be designed to control airborne dusts at or below acceptable exposure guidelines. **DO NOT** use compressed air or dry sweeping to remove dust from work area. Dusts should be removed using vacuum or wet clean-up methods (wet towels, use of mists, etc.).

Under dusty conditions, employees should wear coveralls or other suitable work clothing. Contaminated clothing must be vacuumed before removal and respiratory protection should be the last article of clothing removed. **DO NOT REMOVE** dusts from clothing by blowing or shaking. Practice good housekeeping. Wash thoroughly after handling. Launder contaminated clothing before re-wearing. Do not take contaminated clothing home.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Pyrite may slowly oxidize over time in the presence of water or moisture and air to form sulfuric acid. Heat greatly accelerates this reaction. Do not expose to temperatures > 400 °F without appropriate control measures. Store in a dry area in closed containers. Storage and work areas should be periodically cleaned to minimize dust accumulation.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Quartz (14808-60-7)

USA ACGIH	ACGIH TWA (mg/m ³)	0.025 mg/m ³
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Silica, cristobalite (14464-46-1)

USA ACGIH	ACGIH TWA (mg/m ³)	0.025 mg/m ³
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8.2. Exposure controls

Appropriate engineering controls : Use local exhaust and general ventilation as necessary to control air contaminants at or below acceptable exposure guidelines. Collection systems must be designed and maintained to prevent the accumulation and recirculation of respirable silica into the workplace. Additional controls to limit exposure to crystalline silica may include but are not limited to: wet processes, installation of dust collection systems, dust control additives, enclosed work processes, and automated processes.

Hand protection : Protective gloves are recommended.

Eye protection : Safety glasses with side shields or goggles.

Skin and body protection : Use body protection appropriate for task.

Respiratory protection : If exposure limits are exceeded or irritation is experienced, NIOSH approved respiratory protection should be worn.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Solid

Appearance : Mineral

Color : Bright yellow, brassy metallic

Odor : Odorless.

Odor threshold : No data available

pH : No data available

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Relative evaporation rate (butyl acetate=1)	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: No data available
Relative vapor density at 20 °C	: No data available
Specific gravity	: 5
Solubility	: Insoluble
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosive limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

None.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Will not occur.

10.4. Conditions to avoid

Avoid exposure to heat in the presence of water and oxygen.

10.5. Incompatible materials

Pyrite will slowly oxidize in the presence of water or moisture to form sulfuric acid. The presence of heat accelerates the reaction and the rate of formation of sulfur oxides and sulfuric acid. Silica is incompatible with strong oxidizers.

10.6. Hazardous decomposition products

Pyrite will decompose at elevated temperatures (> 400 °F) to form sulfur oxides and in the presence of moisture or water, sulfuric acid. Quartz may convert to cristobalite at high temperature (> 1470 °C).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Quartz (14808-60-7)	
LD50 oral rat	500 mg/kg
ATE US (oral)	500.00000000 mg/kg

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: May cause cancer. IARC and NTP classify respirable crystalline silica as a confirmed or known human carcinogen. Although OSHA has not promulgated a specific standard for crystalline silica, materials that contain > 0.1% crystalline silica should be treated as a confirmed carcinogen for hazard communication purposes (29 CFR 1910.1200).

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Quartz (14808-60-7)	
IARC group	1 - Carcinogenic to humans
National Toxicity Program (NTP) Status	2 - Known Human Carcinogens

Silica, cristobalite (14464-46-1)	
IARC group	1 - Carcinogenic to humans

Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified

Silicosis is a progressive fibrotic pneumoconiosis that greatly decreases the ability of the lungs to provide oxygen (decreased pulmonary capacity). Three types of silicosis have been identified. Acute silicosis can occur several weeks or months following exposure to very high levels of crystalline silica and can result in death in months or within several years. Accelerated silicosis can occur 5-10 years after exposure to higher levels of crystalline silica. Chronic silicosis is the most common type and usually occurs after 10 or more years of exposure to low levels of crystalline silica.

Increased incidence of chronic bronchitis was been reported in pyrite miners exposed to high dust concentrations. The increased incidence was believed to be due to the high dust concentrations and hot and humid microclimate with marked thermic gradients with air pollution from SO₂. Repeated inhalation may lead to accumulation of iron in the body.

Animal studies indicate that cristobalite has a greater potential to produce fibrosis than quartz. Cristobalite produces a more severe response than quartz and fibrosis elicited is diffuse rather than nodular.

Other: Silica particles less than 10 µm are considered respirable; however, particles retained in the lungs are generally much smaller. A median diameter of particles retained in the lungs has been cited as 0.5-0.7 µm.

Aspiration hazard	: Not classified
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SECTION 12: Ecological information

12.1. Toxicity

This product is a naturally occurring substance. Pyrite mines are a cause of acid mine drainage in the environment due to the formation of sulfuric acid.

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on ozone layer : Product does not contain ozone depleting substances.

Effect on the global warming : No known ecological damage caused by this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14: Transport information

In accordance with DOT

Not a dangerous good in sense of transport regulations

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SECTION 15: Regulatory information

15.1. US Federal regulations

Quartz (14808-60-7)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Pyrite (FeS₂) (1309-36-0)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Silica, cristobalite (14464-46-1)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. US State regulations

Quartz (14808-60-7)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significance risk level (NSRL)
Yes				

Quartz (14808-60-7)

U.S. - Massachusetts - Right To Know List
 U.S. - Minnesota - Hazardous Substance List
 U.S. - New Jersey - Right to Know Hazardous Substance List
 U.S. - Pennsylvania - RTK (Right to Know) List

Silica, cristobalite (14464-46-1)

U.S. - Massachusetts - Right To Know List
 U.S. - Minnesota - Hazardous Substance List
 U.S. - New Jersey - Right to Know Hazardous Substance List
 U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Full text of H-phrases:

Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Carc. 1A	Carcinogenicity Category 1A
H302	Harmful if swallowed
H350	May cause cancer

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product