Safety Data Sheet

Conforms to Regulation (EC) No. 1907/2006 (REACH),
Annex II, as amended by Regulation (UE) Nº 453/2010

Ferro Bio

Version 3.1 (last revision): 28/11/2023

1. Identification of the substance/mixture and the company

1.1 Identifying product (trade name): Ferro Bio

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses of the product: Adsorbent of hydrogen sulfide in biogas plants.
Non recommended uses: Other uses are not recommended unless an assessment has been conducted before the start of that use, showing that the risks associated with their use are controlled.

1.3 Supplier's details:
Name: Making Best Colors Chemical Industries SA (MBC Chemical Industries)
Address: C/ Bélgica, 5, 44300 Monreal del Campo (Teruel), Spain.
Phone number: +34 689 109 178 E-mail: info@mbcchemicals.com

1.4 Emergency phone number: +34 689109178 (24 h.)

2. Hazards identification

This material may contain quartz as impurity in a concentration lower than 10%. The size of these particles is between 30-40 µm therefore, is not consider Respirable Crystalline Silica (RCS). Nevertheless, we recommend respiratory protection in the presence of dust.

2.1 Classification of the substance or mixture according to Regulation (EC) Nº 1272/2008 (CLP):

Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008.

2.2 Label elements according to Regulation (EC) Nº1272/2008 (CLP):

Pictogram: None

Signal word: None

2.3 Supplemental Hazard Statements:

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Precautionary statements:

General precautionary statements**.** If medical advice is needed, have a product container or label at hand (P101).

Prevention: Do not breathe dust (P260).
Response: Get medical advice/attention if you feel unwell (P314).

Other non-classified hazards: Handling and/or processing of this material may generate dust, which may cause mechanical irritation of the eyes, skin, nose, and throat.

3. Composition and identification of ingredients

3.1 Substances

Chemical identity: Mixture of iron oxides and hydroxides.

Minerals	Formula	%	CAS No.
Goethite/Hematite	α-FeOOH / α -Fe_2O_3	50-60	1310-44-1 / 1317-60-8
Manganese minerals	Simple and complex anhydrous and hydrated Mn-oxides	3 (±1)	-
Illite	$K_{0,7}Al_2[Al_{0,7}Si_{3,3}O_{10}](OH)_2$	5.0 (±2)	12173-60-7
Vermiculite	$Mg_3[Si_4O_{10}](OH)_2 \cdot 4H_2O$	3.5 (±1)	1318-00-9
Kaolinite	$Al_2Si_2O_5(OH)_4$	3.0 (±1)	1318-74-7
Quartz, non-respirable	α-SiO_2	6.0 (±2)	14808-60-7
Dolomite	$MgCO_3$+Ca $Mg(CO_3)_2$	<2.0	546-93-0 / 16389-88-1
Other minerals	Minor minerals of Ti, P y Zr	<1.0	-
Water	H2O absorbed.	<2.0	7732-18-5

4. First aid measures

4.1 Description of first-aid measures

In case of inhalation: Move exposed person to fresh air. Get medical attention if symptoms occur.

In case of skin contact: This product does not cause skin irritation by itself. In case of irritation wash the area with water and soap.

In case of eye contact: This product does not cause eye irritation by itself. In case of irritation flush your eyes carefully with plenty of water for several minutes. Remove any contact lenses if it is an easy task and continue rinsing them.

In case of ingestion: Ingestion of high dosages of product is unlikely. If this occurs, do not induce vomiting except by medical advice. If the victim is conscious and alert, give him/her water to rinse his mouth drinking straightaway large quantities of it. Look for medical advice immediately.

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

There are not known symptoms nor effects.

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

No data available

5. Fire-fighting measures

Extinguishing suitable measures: In case of fire, use water spray (fog), dry chemicals or CO_2. Avoid the use of high-pressure water, which could generate dust.

Specific hazards related to the product: This product is not flammable or explosive.

Special protective equipment and precautions for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus with a full face-piece operated in positive pressure mode.

6. Accidental release measures

6.1 Personal precautions, protective equipment, and emergency procedures
Advice for non-emergency personnel: If this product is released it can generate dust. Avoid inhalation of dust. Ensure adequate ventilation. Put on appropriate personal protective equipment (see Section 8). Hazard of slipping on spilt product.

6.2 Environmental precautions
This product is not hazardous for the environment, No special precautionary measures necessary.

6.3 Methods and materials for containment and cleaning up.
Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dust and prevent wind dispersal. Dispose of it via a licensed waste disposal contractor.

7. Handling and storage

Handling: Handle the product in well-ventilated areas or with a ventilation system which maintains the levels of crystalline silica and ferric oxide under the limits of its occupational exposure (OEL/PEL) (see section 8). Do not breathe dust, avoid handling that can generate it and do not permit dust to collect on workplace. Avoid contact with eyes and skin to prevent mechanical irritation. Protective clothing, dustproof goggles and leather/rubber gloves are recommended. Wash or vacuum clothing that has become dusty and observe good personal hygiene.

Storage: Store at moderate temperatures in a dry and well-ventilated area away from strong oxidizers and acids. Ensure containers are adequately labelled and protected against physical damage.

8. Exposure control and personal protection

The Occupational exposure limits of the constituent substances are shown next:

Iron Oxide (fume or respirable dust) (CAS 1309-37-1)					Quartz (CAS 14808-60-7)			
Country	Limit Value – 8 hours		Limit value – Short term		Limit Value – 8 hours		Limit Value – Short term	
	ppm	mg/m^3	ppm	mg/m^3	ppm	mg/m^3	ppm	mg/m^3
Australia		5				0.1		
Austria		5 (respirable aerosol)		10 (respirable aerosol)		0.15 (respirable aerosol)		10(respirable aerosol)
Belgium	2	5				0.1		
Canada		5				0.1		
China		Not available				1.0 (respirable fraction)		
Denmark		3.5		7		0.3 (inhalable aerosol) 0.1 (respirable aerosol) 0.05 (respirable fraction)		0.6(respirable aerosol) 0.2(respirable aerosol)
Finland		5				0.05		
Hungary		6 (respirable aerosol)				0.15 (respirable aerosol)		
Ireland		5		10		0.1		

New Zealand		5				0.2		
Poland		5		10		Not available		
Singapore		5				0.1 (respirable fraction)		
South Korea		5				0.05		
Spain		5				0.1 (respirable fraction)		
Sweden		3.5				0.1 (respirable fraction)		
Switzerland		3 (respirable aerosol)				0.15 (respirable aerosol)		
USA- NIOSH		5 (as Fe)				0.05		
USA-OSHA		10				30/ (%silica+2) total dust 10/(%silica+2) respirable dust		
United Kingdom		5		10		0.3		

Measures of personal protection and equipment (EPP):
Eye protection: Dust-proof goggles are recommended when handling this product.
Skin protection: If prolonged or repeated skin contact is likely, bodysuit, boots and leather/rubber gloves are recommended to avoid mechanical irritation by friction.
Respiratory protection: If air concentrations of hazardous substances are unknown or higher than their occupational exposure limits, wear an approved air purifying dust respirator. Follow the regulations found in European Standard EN 149 or OSHA 29CFR 1910.134 to select the respirator. Considering that quartz has the lowest OEL in this product, use the table below to choose the adequate respirator.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

9. Physical and chemical properties

Appearance: Brown powder.
Odor: Odorless.
Odor threshold: Not applicable.
pH: The pH value of the water extract is 7.0-9.0
Melting point/freezing point: These products are solid in normal conditions. The melting or decomposition point of their main constituents are the following ones:

Hematite (α-Fe_2O_3) ~1565ºC (2849ºF)
Goethite (α-FeOOH) >1000ºC (>1832ºF)

Initial boiling point: Not applicable.
Flash point: Not-flammable.
Evaporation rate: Not applicable.
Flammability (solid, gas): Not-flammable.
Upper / lower flammability or explosive limits: Not applicable.
Vapor pressure: 0.0 mm Hg a 20 ºC (68 ºF).
Vapor density: Not applicable.
Relative density: 2.2-2.4 with respect to water at 3.98 ºC (39.2 ºF).
Solubility: Negligible (less than 0.20% wt.) in water at 20° C (68 ºF).
Partition coefficient: Not applicable.
Auto-ignition temperature: Not applicable.
Decomposition temperature: The α-Fe2O3 decomposes at 1565ºC. α-FeOOH decomposes at 180-200ºc.
Viscosity: Not applicable.
Explosive properties: Not applicable.

Oxidizing properties: Not applicable.

10. Stability and reactivity

Chemical stability: Stable under ordinary conditions of use and storage.

Incompatible materials: Calcium hypochlorite, carbon monoxide, hydrogen peroxide, hydrazine, fluorine, bromine pentafluoride, chlorine trifluoride, oxygen difluoride and strong acids (hydrofluoric, performic…).

Hazardous decomposition products: None under normal conditions.

11. Toxicological information

Component	Acute toxicity		Species
Hydrated Iron Oxide α-FeOOH CAS: 20344-49-4 / 51274-00-1	LD50 oral	>10000 mg/kg	Rat
	LD50 skin	Not relevant	Rat
	LC50 inhalation	>5mg/ L/4h	Rat
Hematite [α-Fe_2O_3] CAS: 1317-60.8/1309-37-1	LD50 oral	>5000 mg/kg	Rat
	LD50 skin	Not relevant	Rat
	LC50 inhalation	>5mg/L/4h	Rat
Quartz [α-SiO_2] CAS: 14808-60-7	LD50 oral	>2000mg/kg	
	LD50 skin	>2000mg/kg	
	LC50 inhalation	>5mg/L/4h	

12. Ecological information

Component	Toxicity for	Test	Result	Species	Exp.
Hydrated Iron Oxide [α-FeOOH] CAS: 20344-49-4 / 51274-00-1	Microorganisms	ISO 8192	Acute EC50>10000 mg/l	Activated sludge.	3 h
	Crustaceans	OECD 202	Acute EC50>100 mg/l	Daphnia magna	48 h
	Fish	OECD 203	Acute EC0>100000 mg/l	Danio Rerio	96 h
Hematite [α-Fe_2O_3] CAS:1317-60-8/ 1309-37-1	Microorganisms	ISO 8192	Acute EC50>10000 mg/l	Activated Sludge	3 h
	Crustaceans	OECD 202	Acute EC50>100 mg/l	Daphnia magna	48 h
	Fish		Acute LC0>50000 mg/l	Danio Rerio	96 h

Other adverse effects: The accidental spill of this product may cause visual impact due to its brownish color.

13. Disposal considerations

Waste treatment methods: Product residues and uncleaned empty containers should be packaged, sealed, labelled, and disposed of or recycled according to relevant national and local regulations.

Waste classification: Not hazardous (defined by Directive of the EU 2008).

14. Transport information

The product is not covered by the international transport regulation of hazardous goods (IMDG, IATA, ADR/RID).

Specific precautions for users: Keep separated from foodstuffs.

15. Regulatory information

Specific regulation and legislation about safety, health and environment related to the product is described next:

EUROPEAN COMMUNITY- Regulation (EU) 528/2012, (EU) 649/2012, (EC) 1907/2006 and (EC) 1272/2008: None of the constituents of this product appears on the lists of the hazardous substances that are forbidden, restricted or submitted to special requirements by these regulations.

IARC (International Agency for Research on Cancer): Quartz (crystalline silica) is classified by IARC as a human carcinogen belonging to Group 1.

WKG Classification (German Water Endangerment Class): nwg (nicht wassergefährdend, non-hazardous to waters)

16. Other information

Abbreviations and acronyms:
PBT: Persistent, Bio accumulative y Toxic
yPyB: Very Persistent and very Bio accumulative
DNEL: Derived No Effect Level
PNEC: Predicted No Effect Concentration
LD50: Average Lethal Dose
LC50: Average Lethal Concentration
EC50: Average Effective Concentration

Bibliographic references and data sources:
Safety data sheets of the components of the mixture, and the website of the European Chemical Agency (ECHA).

- Royal Decree 374/2001, of April 6, on the protection of the health and safety of workers against risks related to chemical agents at work. Amended by Royal Decree 598/2015, of July 3.
- The European Network of Silica (NEPSI), "Guide to good practice for the protection of worker health through the proper handling and use of crystalline silica and products containing crystalline silica," EU, 2006.

Employed method for the classification according to the Regulation (EC) 1272/2008:
Mixture classification based on the component's classification.

Recommendations for worker´s training:
The workers who manipulate the product have received the information and the training related to the safety rules and equipment.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text. It is the user's responsibility to satisfy itself as to the suitability and completeness of such information for its own particular use.