

SAFETY DATA SHEET

Conforms to ISO 11014-1 and the South African
Occupational Health and Safety Act (86/1993)

July 2022

ASH MATERIAL

1. COMPANY INFORMATION

Name: Southern Proteins (Pty) Ltd
Address: Farm Weltevreden
Dryden
Eloff
2211
Trading Name: Southern Proteins
Registration number: 2016/441054/07
Tel Number: 013 665 1027

2. HAZARDS IDENTIFICATION

High proportions of amorphous non-crystalline materials (80.2%) with minor and variable amounts of crystalline phases, most commonly mullite ($3\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2$) and quartz (SiO_2), are the main components of the boiler ash. The x-ray diffraction (XRD) analysis showed that mullite, which is typically present in the matrix of ash, is most dominant with a content of 13.8%. This is followed quartz with 3.9% and the clay mineral kaolinite ($(\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4)$) with 0.8%. The amorphous phase can be subdivided into amorphous aluminium-silicon and amorphous silicon.

The multi-element analyses results reveal a variety of major elements to be present in concentrations >1% but these elements, including silica (Si), aluminium (Al), calcium (Ca) and iron (Fe) do not represent major health concerns and are relatively low risk elements.

The pH of the material was measured as 9.33 (1:20) indicating that the material is naturally alkaline and, therefore, it is highly unlikely that dissolution of trace metals will occur in significant amounts. Trace metals Metalloids such as arsenic (As), molybdenum (Mo) and boron (B) could be solubilised under alkaline conditions.

The following potential hazards are recognised:

Physical hazards

The ash material is not explosive, flammable or oxidising and do not release toxic gases when in contact with water or acid. It is, therefore, classified as non-hazardous in terms of physical hazards.

Health hazards

The constituents present in concentrations > 1% include silica (Si), aluminium (Al), iron (Fe) and calcium (Ca) but these constituents do not constitute health risks. Carcinogenic metals, such as As, cadmium (Cd), chromium (Cr) and nickel (Ni) are all present in quantities $\leq 0.1\%$. The waste materials are, therefore, not considered as hazardous in terms of human health.

Target Organs: May cause respiratory irritation upon exposure to high airborne concentrations. May cause eye irritation if material contacts eye.

Hazard statements:

May be harmful if swallowed (H303).

May be harmful if inhaled (H333).

Precautionary Statement:

Wear protective gloves/protective clothing/eye protection/face.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present. Continue rinsing.

If skin irritation occurs: Get medical advice/attention.

If eye irritation persists: Get medical advice/attention.

Environmental hazards

Ash poses no risk of substandard leachate quality generation unless it were to come into contact with an acidic solution, which is unlikely to occur.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

The ash material is composed of the following:

Constituent	Content (%)	CAS number
SiO ₂	27.4	7631-86-9
Al ₂ O ₃	19.0	1344-28-1
CaO	3.76	1305-78-8
Fe ₂ O ₃	3.19	1309-37-1
TiO ₂	1.06	13463-67-7

Constituent	Content (%)	CAS number
MgO	0.88	1309-48-4
K ₂ O	0.385	1309-48-4
P ₂ O ₅	0.287	7723-14-0
MnO	0.029	1344-43-0
LOI	42.3	N/A

4. FIRST AID MEASURES

- Eye: Flush eyes with plenty of water for a minimum of 15 minutes. Keep rotating the eyes to ensure complete flushing of all particles. Do not rub eyes. Seek medical attention promptly if irritation persists or any abrasions occur.
- Skin: Not severely abrasive on skin but skin should be washed with cool water and mild soap or detergent if rash or irritation occurs.
- Inhaled: No specific first aid measures are needed but remove affected person promptly to fresh air. Seek medical attention for discomfort or if coughing or other symptoms do not subside. Always use proper PPE.

5. FIRE FIGHTING MEASURES

- Extinguishing Media: Dry powder, carbon dioxide, foam or water spray.
- Exposure Hazards: The product will not ignite easily.

6. ACCIDENTAL RELEASE MEASURES

- Personal Precaution: Wear personal protective clothing with a respiratory mask.
- Emergency: Isolate the spill and prevent further leakage or spillage.
- Environmental: Prevent entry of the spilled product into waterways, sewers or confined areas.
- Clean up methods: Sweep up and shovel it into suitable containers for re-use, recovery or disposal. Avoid creating a dust cloud.

Other Information: See Section 13 for disposal Considerations.

7. HANDLING AND STORAGE

- Handling: Handle in a well-ventilated area. Keep dust formation to a minimum. Always wear correct PPE.

Protective clothing: Chemical protective clothing should not be required under normal circumstances when using this material.

Storage: No special storage requirements but store where excessive wind cannot disperse dust particles.

8. ENGINEERING MEASURES

Occupational Exposure Limits (OEL):

There are no exposure limits available for the waste stream, therefore the ingredients or a substance close to the ingredients will be used. Below is Exposure Limits for dust and silicon. The exposure limits for nuisance dust (particulates not otherwise regulated) are the most important and should be used.

Particulates not otherwise regulated – Total Dust

TWA 10 mg/m³ (total) TWA 5 mg/m³ (resp)

General Industry - TWA 15 mg/m³

Construction Industry – TWA 15 mg/m³

TWA 10 mg/m³ (total) TWA 5 mg/m³ (resp)

ACGIH Guideline: TWA 10 mg/m³ (Inhalable Particles)

Silicon [CAS No. 7440-21-3]

TWA 10 mg/m³ (total) TWA 5 mg/m³ (resp)

TWA 15 mg/m³ (total) TWA 5 mg/m³ (resp)

Personal protection during working application:

Respiratory: Suitable dust masks of same nature as for nuisance dust (NB, recommendations/specifications to be informed by an occupational health practitioner (only in its dry state).

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Dark Grey
Odour:	None
Odour Threshold:	Not applicable since there is no odour
pH:	9.33
Melting Point:	Not Available

Boiling Point:	Not available
Flash Point:	Not Applicable Inorganic Substance
Evaporation Rate:	Not available
Flammability:	Not Flammable
Explosion limits:	Not Explosive
Vapour Pressure:	Not Available
Vapour Density:	Not Applicable
Relative Density:	Not Available
Water Solubility:	Not available
Partition Coefficient:	Not Applicable, Inorganic Substance

10. STABILITY AND REACTIVITY

Chemical stability:

Stable under normal temperatures and pressures

Possibility of Hazardous Reactions:

Avoid reactions with acids such as hydrofluoric acid and nitric acid and bases.

Conditions to Avoid:

Avoid generating dust. Ash poses an inhalation risk when dry.

11. TOXICOLOGICAL INFORMATION

Acute Potential Effects:

Possible silicosis, fibrosis, cancer (in its dry state only)

May be harmful if swallowed

May be harmful if Inhaled

Chronic Potential Health Effects:

The substance may be toxic to lungs and upper respiratory tract when in its dry form. Repeated or prolonged inhalation or unprotected exposure to the substance can produce target organ damage.

Likely routes of exposure: Eye contact, skin contact, inhalation

Target Organs: Skin, Eyes, Respiratory System

12. ECOLOGICAL INFORMATION

Persistence and Degradability:

Most ingredients are of inorganic nature and do not biodegrade.

Ecotoxicity:

Daphnia 48hr mortality rate:	-100% - Highly Toxic
Fish 96hr mortality rate:	-100% - Highly Toxic
Aquatic Plants 72hr mortality rate:	-68% - Toxic
Micro-algae	Results inconclusive
Bacteria	Not tested

Mobility in soil:

Constituents relatively insoluble in water.

Expected to be relatively immobile in soil.

Bioaccumulation:

Constituents are relatively insoluble and not expected to bioaccumulate.

13. DISPOSAL CONSIDERATIONS

The preferred methods of disposal are firstly recycling or re-using and lastly landfill. Disposal should comply with the waste disposal legislation as well as any other municipal regulations. This product should never be disposed of down any drains or sewage lines or within watercourses.

14. TRANSPORT INFORMATION

Transport Hazard Class:	None
Environmental hazard:	Not Applicable
Special Precaution for User:	Not Hazardous for transportation. Avoid dust formation.

15. REGULATORY INFORMATION

No constituents contained in this product has been listed in the Hazardous Chemical Substances Regulations for the Occupational Exposure Limit.

National legislation:

Waste Classification and Management Regulations (GN R.634 of 23 August 2013) National Norms and Standards for the Assessment of Waste for Landfill Disposal (GN R.635 of 23 August 2013).

SANS 10228:2010 The identification and classification of dangerous goods for transport (Edition 5).

SANS 10234- A List of classification and labelling of chemicals in accordance with the Globally Harmonized System (GHS).

National Road Traffic Act (Act 93 of 1996).

16. OTHER INFORMATION

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Compiled by: GIY Hydro (Pty) Ltd trading as AquiScience

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