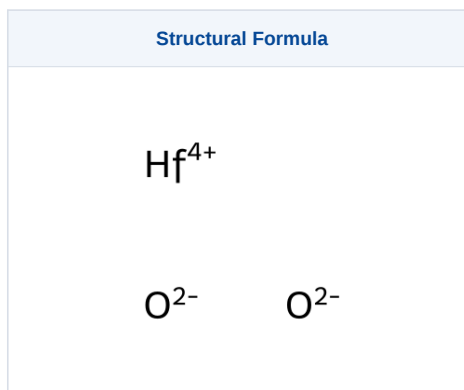


## CERTIFICATE OF ANALYSIS

Standard product specification — applicable to all consignments of this product and grade supplied by Scapex Exports Pvt. Ltd., manufacturer and supplier of quality chemicals.

|                   |                             |
|-------------------|-----------------------------|
| Product Name      | Hafnium Oxide, Powder       |
| C.A.S. Number     | 12055-23-1                  |
| Molecular Formula | HfO <sub>2</sub>            |
| Molecular Weight  | 210.49                      |
| Grade / Standard  | 98% min.                    |
| Physical Form     | Crystalline powder          |
| Product Category  | Inorganic Salts & Compounds |
| Country of Origin | India                       |



## ANALYTICAL RESULTS

| S. No. | Test Parameter                 | Specification                              | Result          | Method                    |
|--------|--------------------------------|--------------------------------------------|-----------------|---------------------------|
| 1      | Description                    | Crystalline powder                         | Complies        | Visual                    |
| 2      | Identification                 | Conforms to the structure of the substance | Complies        | FTIR / Chemical test      |
| 3      | Solubility                     | As per specification                       | Complies        | Visual / Monograph        |
| 4      | Assay                          | Not less than 98.0 % w/w                   | 98.50           | Titrimetry / Instrumental |
| 5      | Matter Insoluble in Water      | Not more than 0.05 % w/w                   | 0.006           | Gravimetry                |
| 6      | pH (5 % w/v aqueous solution)  | As per specification                       | 7.9             | Potentiometry             |
| 7      | Chloride (as Cl)               | Not more than 0.01 % w/w                   | 0.0028          | Turbidimetry / IC         |
| 8      | Sulphate (as SO <sub>4</sub> ) | Not more than 0.02 % w/w                   | 0.0017          | Turbidimetry / IC         |
| 9      | Iron (as Fe)                   | Not more than 20 ppm                       | 4.0 ppm         | ICP-OES / AAS             |
| 10     | Heavy Metals (as Pb)           | Not more than 10 ppm                       | Less than 5 ppm | ICP-OES                   |
| 11     | Moisture                       | Not more than 1.0 % w/w                    | 0.12            | Karl Fischer / Gravimetry |
| 12     | Structure                      | Conforms to reference structure            | Complies        | FTIR / NMR                |

### Remarks

Material supplied against this specification is analysed on every production lot and **conforms** to the limits stated above in all tested parameters. Results shown are the typical values obtained for this grade.

Retained samples are held against every export consignment. Store in tightly closed original packing, in a cool, dry, well-ventilated place away from incompatible materials and direct sunlight.

### Checked and Approved by

**Prem Panchal**  
Quality Assurance  
Scapex Exports Pvt. Ltd.

This document sets out the standard specification for the product named above and applies to all consignments of this grade. It is issued by Scapex Exports Pvt. Ltd. as manufacturer and supplier. Refer to the Material Safety Data Sheet (MSDS) before handling.