SILICON DIOXIDE

Crystalline silica dust | 0.5–10 µm

IGEP, TU Braunschweig, Germany

SHORT DESCRIPTION

Silicon dioxide, also known as silica dust, is an oxide of silicon with the chemical formula SiO2, most commonly found in nature as quartz and in various living organisms. It generally shows a tetrahedral coordination, with four oxygen atoms surrounding a central Si atom. It is considered a basic element that makes up a large amount of the earths crust and could therefore be a good base for the cometary refractory phase. Silicon dioxide can be dangerous if breathed in and cause multiple lung diseases. Usage of appropriate masks is necessary when handling it.

MAIN PROPERTIES

Grain Size (Distribution):	0.5–10 µm (80% 1-5 µm)
Purity:	99%
Material Density:	2.65 kgm^{-3} (0% porosity)
Tensile strength:	45–55 MPa
Volatility/Condensability:	solid
Thermal Conductivity:	1.3–1.5 $Wm^{-1}K^{-1}$
Refractive Index:	see [1] and [2]
Electric Permittivity:	3.6–4.2

REFERENCES

[1] Mikhail N. Polyanskiy. *Refractive index database - Optical constants of SiO2*. 2008. URL: `https://refractiveindex.info/?shelf=main&book=SiO2&page=Radhakrishnan-o` (visited on 10/15/2019).

[2] T. Radhakrishnan. “Further studies on the temperature variation of the refractive index of crystals”. In: *Proc. Indian Acad. Sci. (Math. Sci.)* 33.22 (1951). DOI: `https://doi.org/10.1007/BF03172255`.

MATERIAL IMAGE

Figure 1: Silica Dust

PRODUCTION INFO

Producer	Honeywell
Production rate	N/A
Purchase	142.32 EUR/kg

PROS & CONS

Cost	●●●●○
Availability	●●●●●
Production time	●●○○○

HAZARDS

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