



Crystalline silica

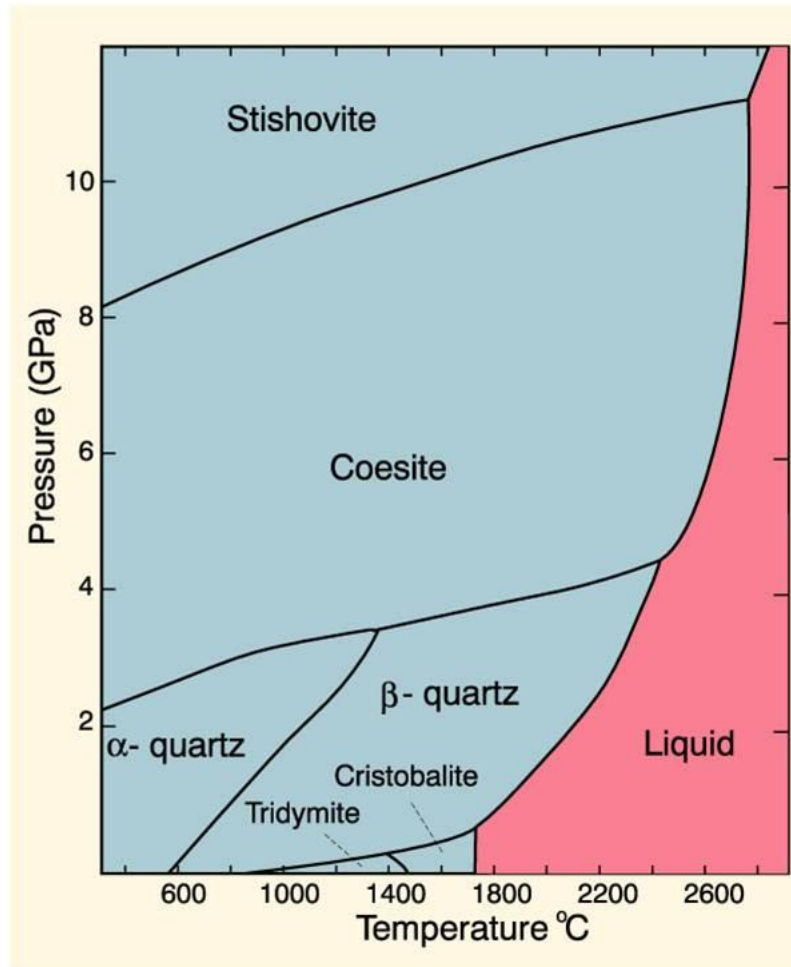
Is it safe?

Autor: Niklas Niederwieser

HOFFMANN
MINERAL
Wir geben Stoff für gute Ideen

$\text{SiO}_2 = \text{SiO}_2$?

Many Polymorphs and Varieties of Silica



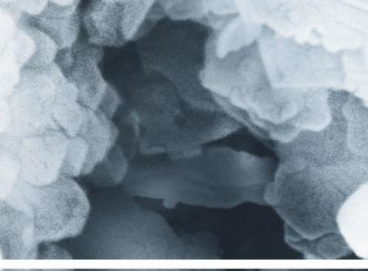
$\text{SiO}_2 \neq \text{SiO}_2$!

Same chemistry but different crystal structure

Totally different properties

Example: Carbon





Neuburg Siliceous Earth

Natural combination of amorphous and crypto-crystalline **silica** and lamellar **kaolinite**

A special and worldwide unique silica
No Quartz!

Test methods:

Mineralogical studies
In Vitro - Testing
Cohort Study
Dustiness

SILICA

MINERALOGICAL
STUDIES

IN VITRO TESTING

COHORT STUDY

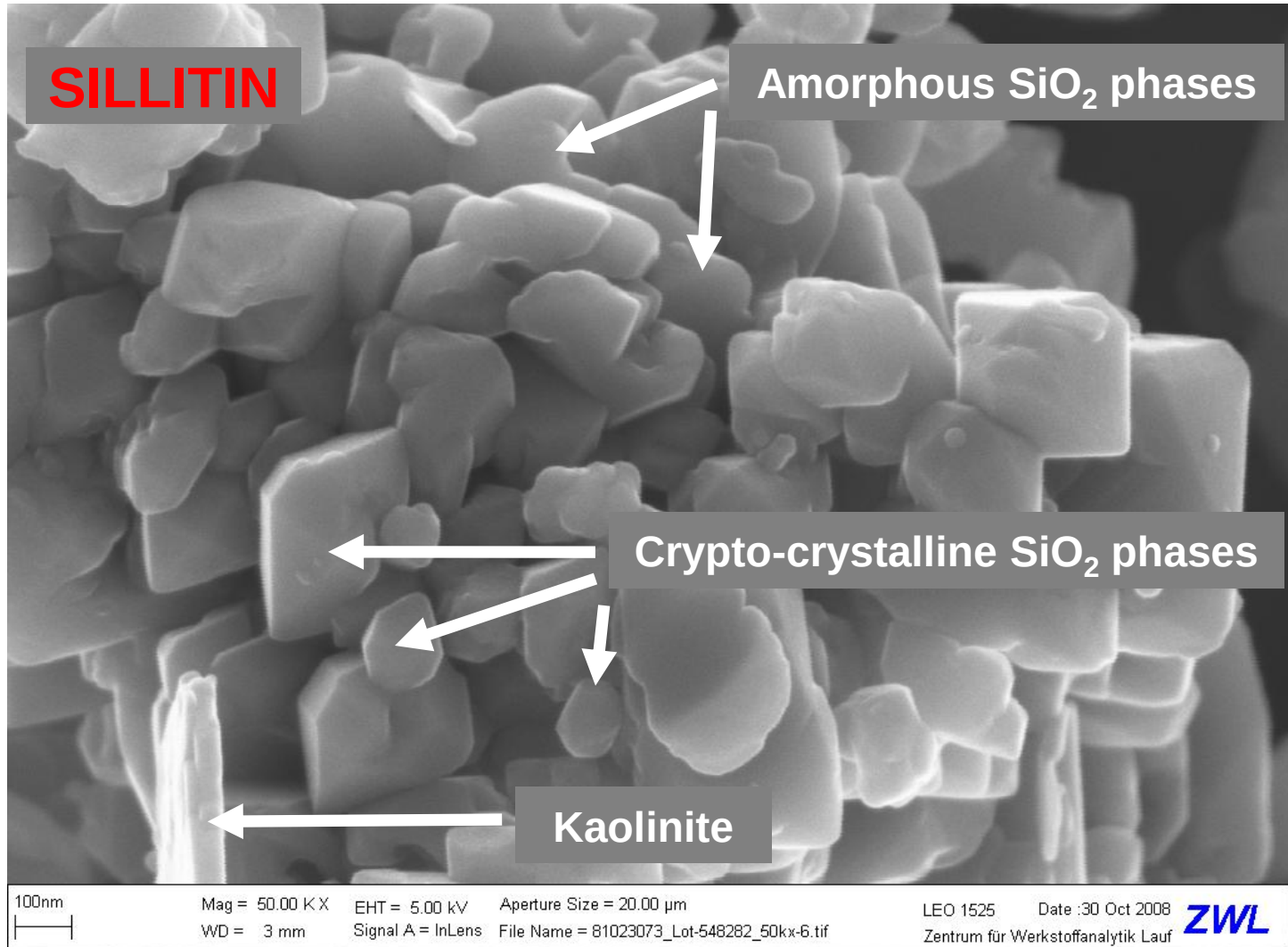
DUSTINESS

CONCLUSION



Scanning Electron Microscope

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Scanning Electron Microscope

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SILLITIN

Round shaped edges
Crystalline silica particles coated with amorphous silica

100nm
H

Mag = 20.00 K X
WD = 3 mm

EHT = 5.00 kV
Signal A = InLens

Aperture Size = 20.00 µm
File Name = 81023073_Lot-548282_20kx-6.tif

LEO 1525 Date :30 Oct 2008
Zentrum für Werkstoffanalytik Lauf

ZWL

Scanning Electron Microscope

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Quartz

sharp edged

shell-shaped fracture

300nm



Mag = 10.00 K X

WD = 4 mm

EHT = 5.00 kV

Signal A = InLens

Aperture Size = 10.00 µm

File Name = Probe7 10kx-2.tif

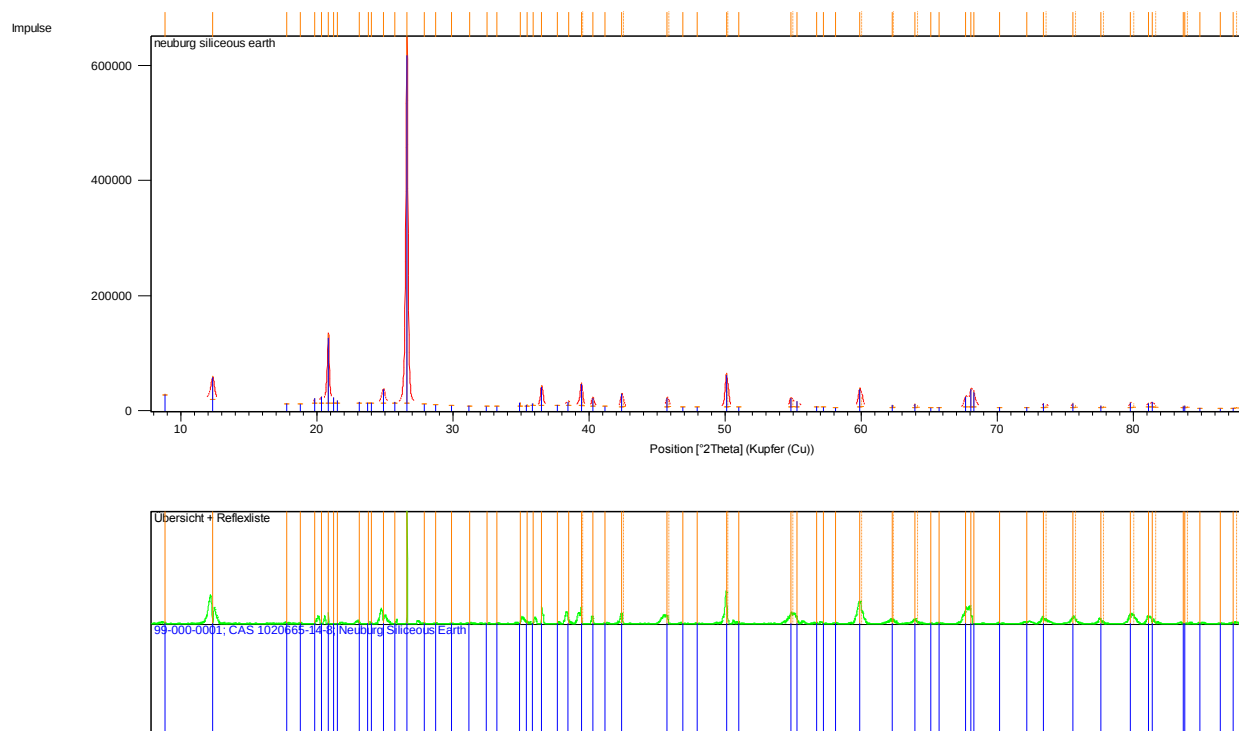
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Date :23 May 2007

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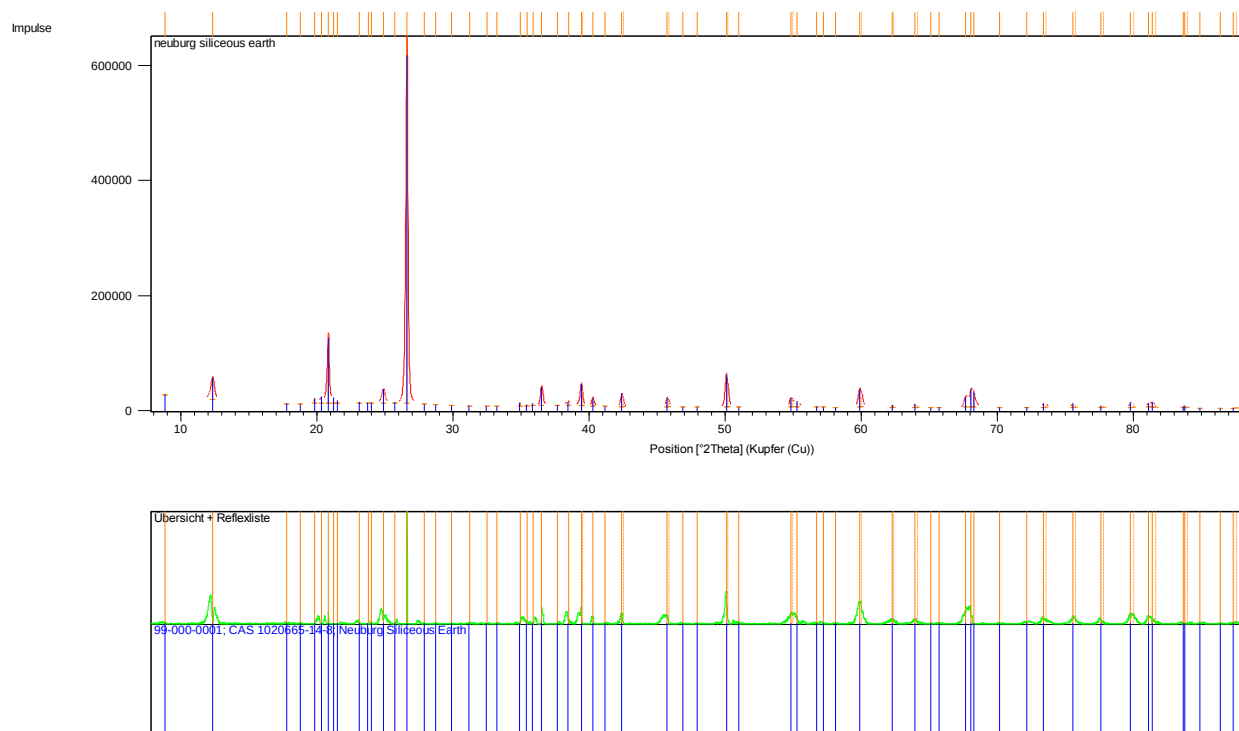
ZWL

X-Ray Diffraction

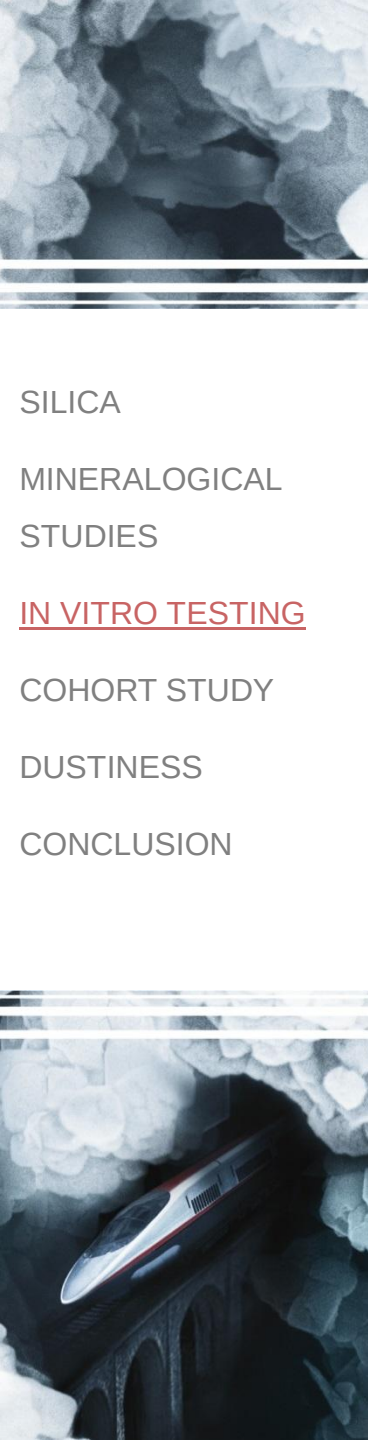


Unique X-Ray “fingerprint” pattern

X-Ray Diffraction



CAS Number 1020665-14-8
CAS Name Siliceous Earth



In Vitro - Testing

The In Vitro particle toxicity of NSE in comparison to standard quartz demonstrated on 4 relevant parameters:

Gluc	Cytotoxicity
ZS	Functional cell damage
TNF	Tumor necrosis factor
ROS	Reactive Oxygen species

In Vitro - Testing

SILICA

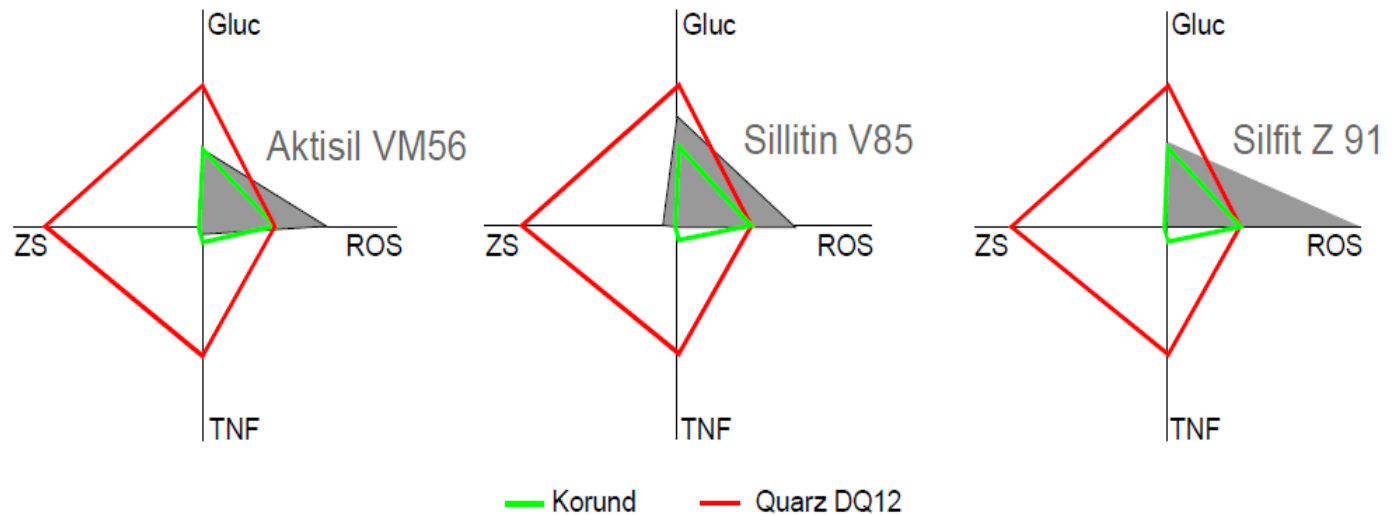
MINERALOGICAL
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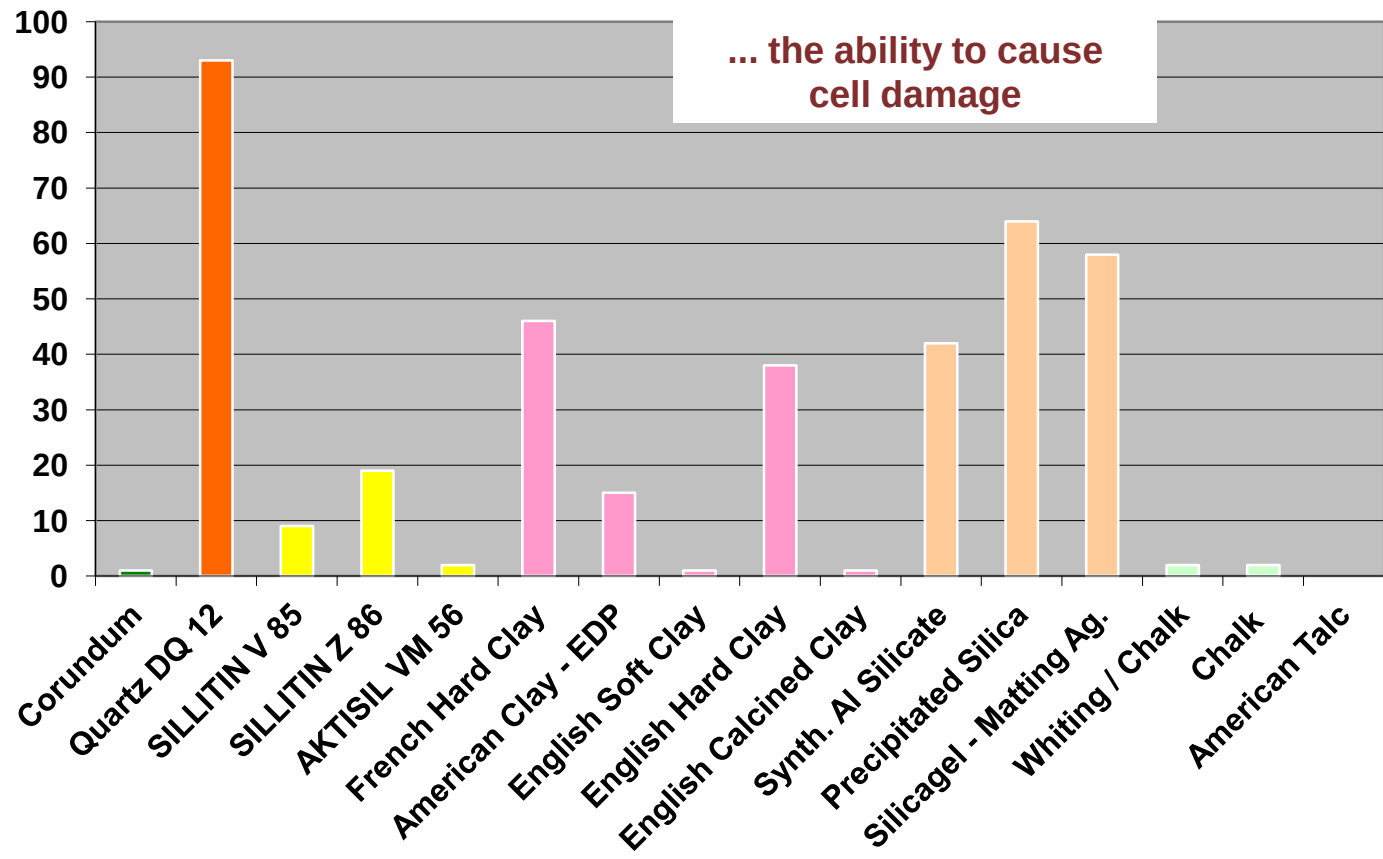
DUSTINESS

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In Vitro - Testing

Low to medium In Vitro - **Cytotoxicity** of NSE





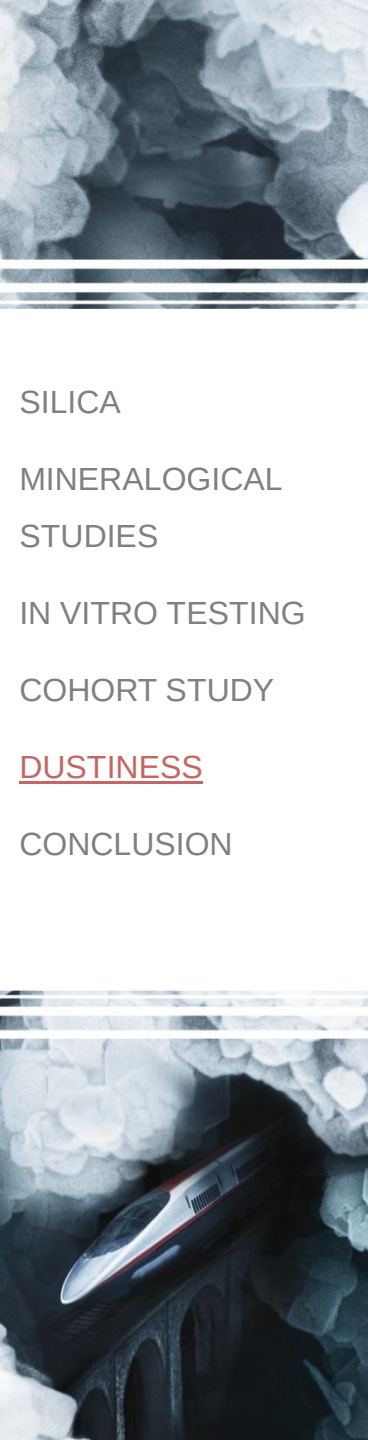
Cohort Study - Humans

Employees Hoffmann Mineral
675 People who worked from 1923 to 2007 at Hoffmann

No significant lung cancer risk

However:

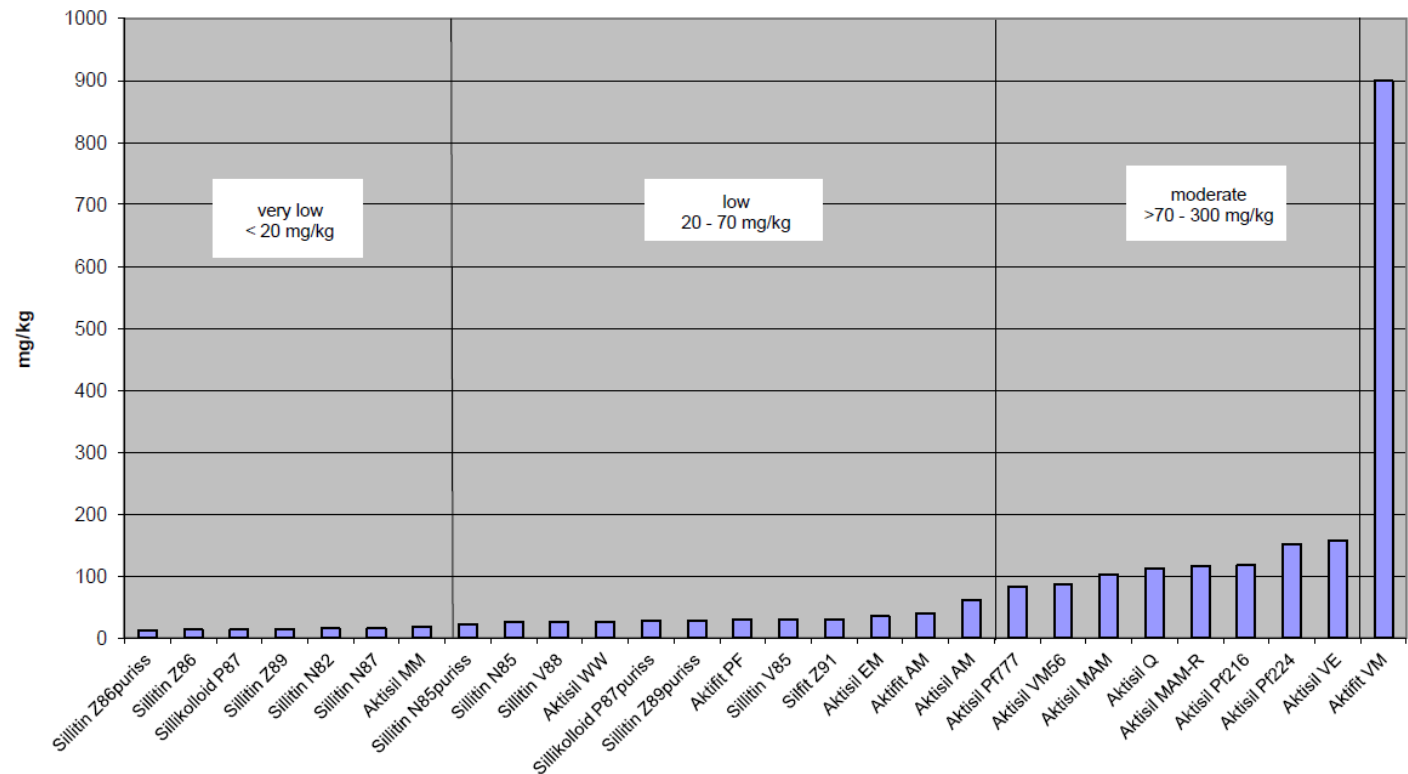
Employees who worked underground in mines and were subject to long-term exposure of $> 0.15 \text{ mg/m}^3$ of respirable fine dust did however show an increased risk of developing silicosis.



Dustiness

Agglomeration of airborne NSE particles

A-dust-development in acc. with EN 15051-3



Conclusion

Neuburg Siliceous Earth: Is it safe?

Silica ≠ Silica

Unique Mineral, No Quartz → Mineralogical studies

Low toxicity → In Vitro – Testing

No increased cancer risk → Cohort study

Low Dustiness → Dustiness Test

Neuburg Siliceous Earth :
Safe when used according the MSDS

SILICA

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Thank you for your attention

