



SILICA NANOPARTICLES -SiO₂

Properties and Application

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SUB-CPMK PERTEMUAN 10

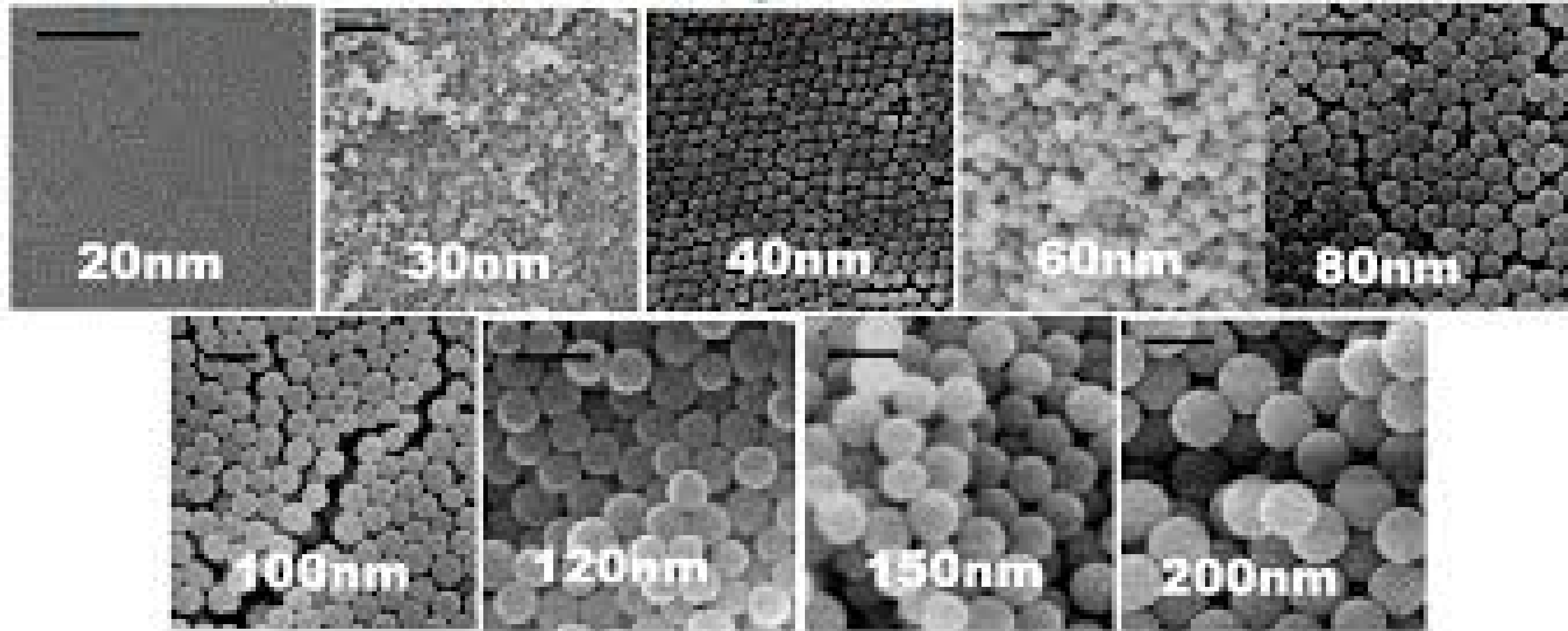
Mahasiswa mampu menyelesaikan permasalahan nanosilika untuk aplikasi drug delivery system.

SiO₂ NANOPARTICLE



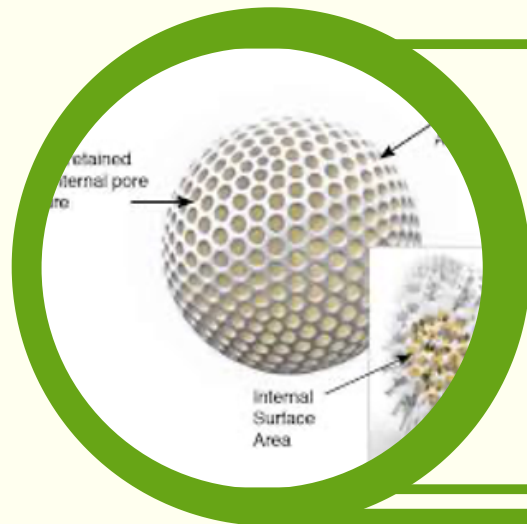
01

Silica Nanoparticle Products SEM Images, Scale bar 200nm



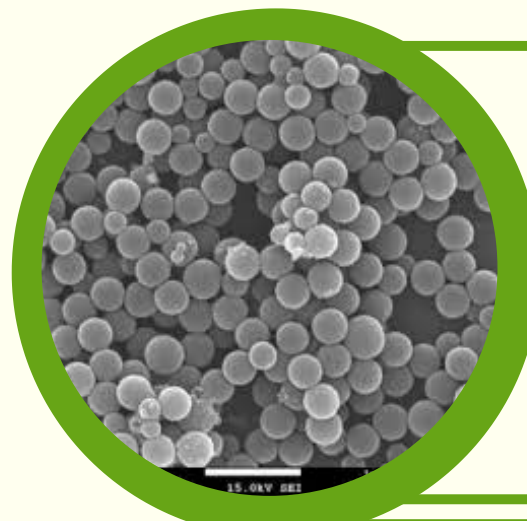
SiO₂ NANOPARTICLE FEATURE

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P-Type (Porous Particles)

- Pore rate of 0,611 ml/gr
- Specific Surface Area (SSA) 640 m²/gr
- UV reflectivity >85%

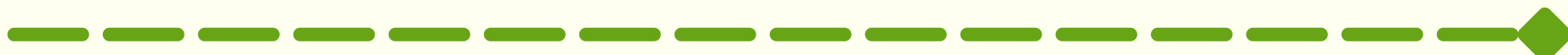


S-Type (Spherical particles)

- Ultraviolet reflectivity >75%

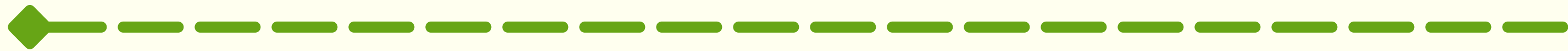
SiO2 NANOPARTICLES PROPERTIES

01



Properties	Metric	Imperial
Density	2,4 g/cm ³	0,086lb/in ³
Molar Mass	59.96 g/mol	-
Melting Point	1600 C	2912 F
Boiling Point	2230 C	4046 F

PROPERTIES OF SiO₂ NANOPARTICLES



Pliability in structure

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Biocompatibility

07

Large Specific surface Area

08

Strong surface adsorption

09

Large surface energy

10

High chemical purity

01

Versatile Functionalization

02

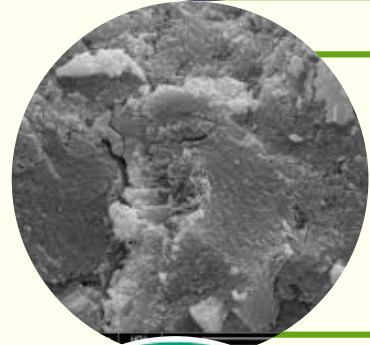
Good Dispersion

03

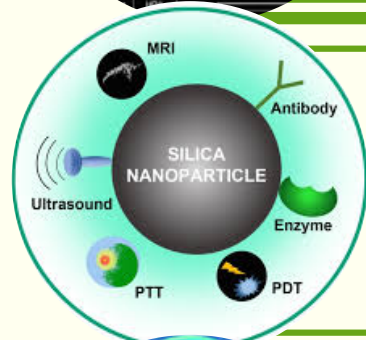
APPLICATION OF SILICA NANOPARTICLES



Additive for the manufacturing of rubber and plastic

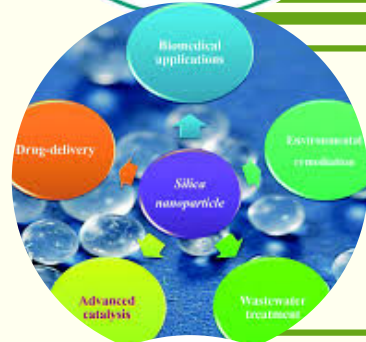


construction materials



Biomedical applications

- drug delivery
- Pharmaceuticals



Biotechnology Applications



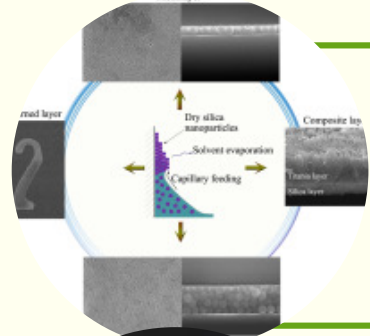
- Catalyst
- Pigment

APPLICATION OF SILICA NANOPARTICLES

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Electronic Substrate



Thin Film Substrate

(<https://doi.org/10/1016/j.surcoat.2018.04.011>)



Electronic Insulators



Thermal Insulators

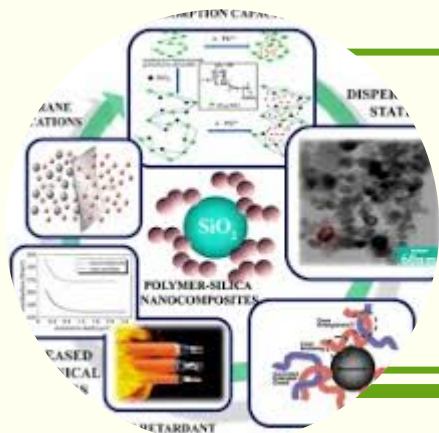


Humidity Sensors

<https://doi.org/10.3390/nano13233005>

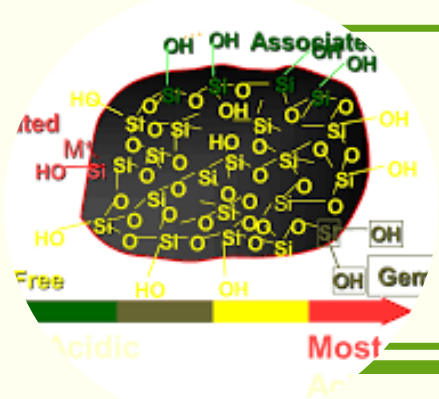
APPLICATION OF SILICA NANOPARTICLES

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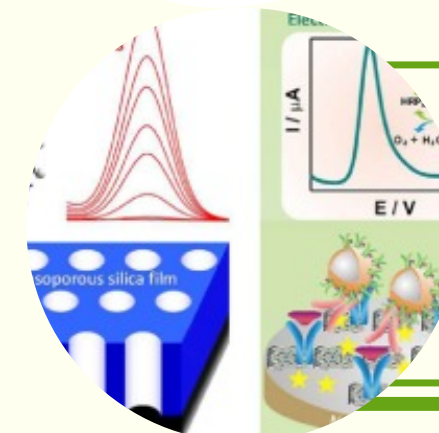


Polymers Nanocomposites

<https://doi.org/10.1016/j.pmatsci.2018.04.002>

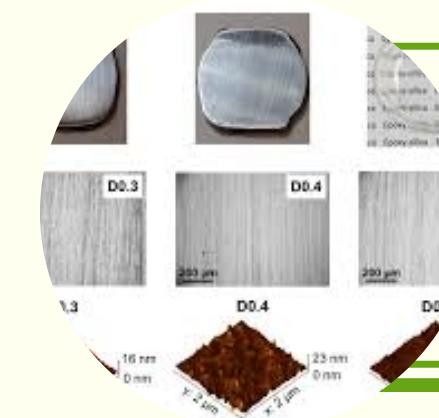


Stationary phases for HPLC



Biosensors

<https://doi.org/10.1016/j.coelec.2018.03.017>



Composite Coatings

<https://doi.org/10.3390/polym14173474>



Nanoteknologi

THANK YOU



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