

## **SiO<sub>2</sub> nanoparticles synthesized from diatomite**

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Applications of silica nanoparticles (SiO<sub>2</sub> NPs) have been widely studied, such as adhesion ability, water resistance, and anti-pollution. Nowadays, it is very popular to apply SiO<sub>2</sub> NPs as constructing materials. The aim of this study is to re-fabricate diatomites into silica nanoparticles, and they can be used as green building materials.

Firstly, the diatomite was purified with HCl and H<sub>2</sub>SO<sub>4</sub> with different concentrations and temperatures. After the purification process, we start to modify the acid-treatment diatomites changed into silica nanoparticles. The reaction temperature, time, and concentration would be the key factors to affect the properties of silica nanoparticles. We hope the final particle size of SiO<sub>2</sub> NPs is around 20 ~ 30 nm. The crystalline structure of SiO<sub>2</sub> NPs was examined by X-ray diffraction (XRD) analysis. The composition of all the samples was measured by X-ray Fluorescence Spectrometer (XRF). The scanning electron microscope (SEM) and atomic force microscope (AFM) were used to analyze the morphology and particle size of the specimens. The synthetic parameters dependent on properties of SiO<sub>2</sub> NPs would be further discussed.

Keywords: Diatomite, purification, modification, SiO<sub>2</sub> nanoparticle.