

# PROCEDURE TO OBTAIN NANOLIMES USED AS CONSOLIDANTS

## Technology for Licensing

### Keywords:

Nanolime, calcium hydroxide, alkoxide, nanoparticles, Si-functionalization.

### Description:

As alternative to the use of synthetic polymers in stone and mortar restoration processes, which are incompatible with inorganic substrates, the use of traditional consolidants such as lime water is recommended. Nevertheless, the low solubility of calcium hydroxide in water reduces the efficiency of the restoration process, which makes it necessary the use of nanoparticles whose sizes and surface areas are decisive in the final consolidation.

This invention describes a synthesis process of silicon-stabilized nanolimes with particle sizes and surface areas respectively in the range of 20-200 nm and 70-140 m<sup>2</sup>/g. The SiO<sub>2</sub>-derived surface functionalization of this nanoparticles reduces the surface charge, allowing greater control over the particle size, dispersion and agglomeration processes.

The nanoparticles obtained by the process of this invention show a net reactivity/efficiency 3 times higher than other products for the same purpose currently available on the market.

Furthermore, depending on the kind of surface functionalization, the physico-chemical properties of the nanoparticles can be modified, extending the application field to other industries.

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A new process to obtain high-purity silicon-functionalized nanolimes suitable for use as a consolidating material in construction has been developed. The nanoparticles obtained by this procedure have smaller particle sizes (< 200 nm), higher surface area (> 70 m<sup>2</sup>/g) and higher reactivity compared to commercial products currently available on the market.

## Advantages and Benefits

### » Simple and effective method

Method to obtain metallic hydroxide nanoparticles with purity percentages greater than 95%.

### » Modulable colloidal behaviour of the nanoparticles

Nanoparticles with minimal aggregation in alcoholic suspensions and high flocculation capacity in aqueous and/or hydroalcoholic suspensions.

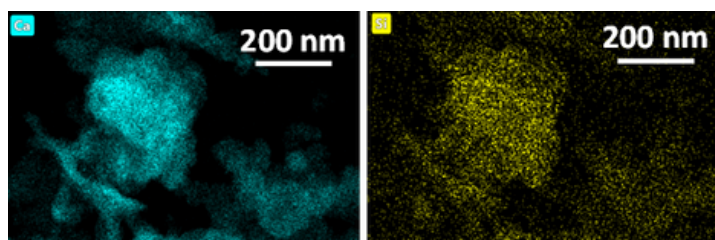
### » Smallest particle sizes

### » High surface area

### » High reactivity

### » Easily applicable to other industries

The application field can be extended by modifying the silicon groups bonded to the surface.



### Patent status:

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