# Nano-sized α-Alumina
## Synthesis, Dispersion, Characterization & Self-Assembly

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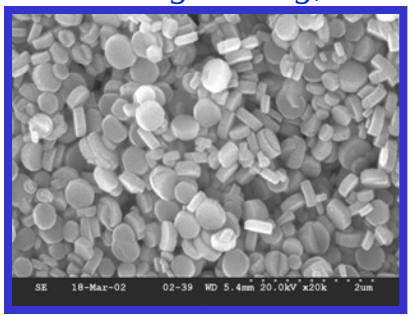
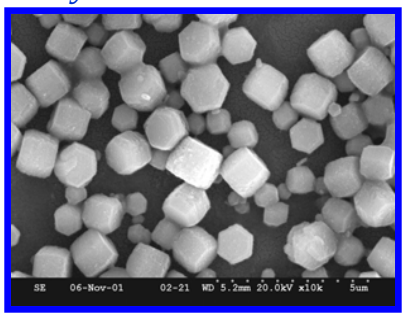
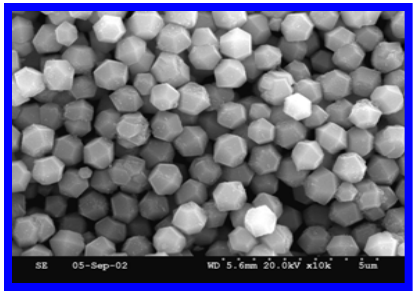
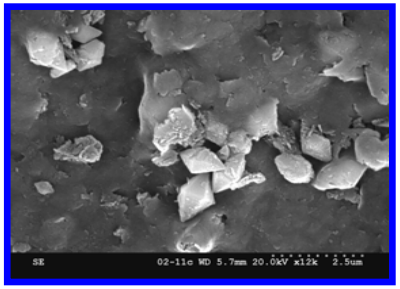
**Abstract:** ***Synthesis under glycothermal conditions*** has the benefits of achieving high chemical purity and homogeneity with controlled size and shape of the ceramic particles. However, this novel technique lacks the theoretical and scientific knowledge of the various forces assisting to ***tailor particle size and shape*** under glycothermal conditions. A better understanding of the solution chemistry, kinetics of precipitation and crystallization, particles surface conditions and charging mechanisms for α-alumina synthesis can help in developing models that can successfully be applied to synthesis of ceramic particles with desired shape and size by solution chemistry techniques in general and under glycothermal conditions in particular.



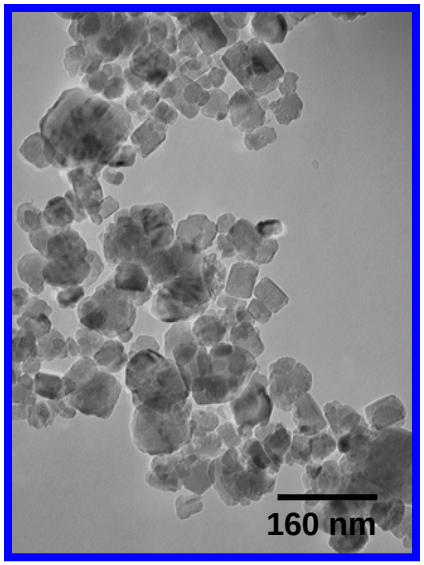

Various shapes of **α-alumina** crystals produced by controlling **processing parameters** like ***temperature, shear rate, solids loading etc.*** and **surface chemistry** by use of ***surfactants, water, acid/base, electrolytes and organic adsorbents***.

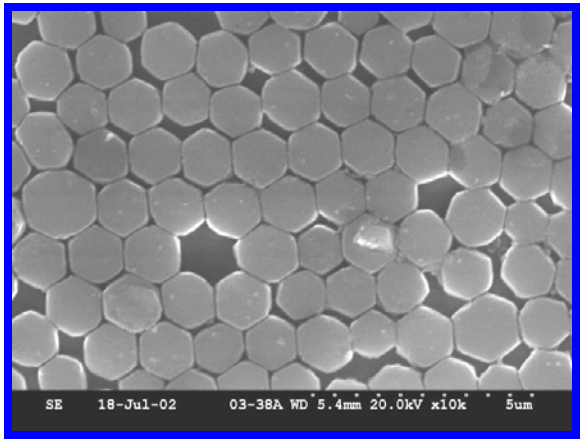



**Nano-particles** of **α-alumina** produced by ***controlled seeding*** of the process.

**Dispersion** is achieved by ***ulta-sonicaton*** and ***surfactant stabilization***.




**Self-Assembly** by ***engineering surface behavior*** of shaped particles.