

**MANUFACTURING OF NANOSIZED CERAMIC MATERIALS USING "ALTAIR THIN FILM" INDUSTRIAL PROCESS.**

Jan Prochazka

Altair Nanomaterials Inc.  
204 Edison Way  
Reno, NV 89502  
Tel: 775 8583716  
janprochazka@altairinc.com

Large scale economical production of nanoparticles of ceramic oxides is facing number of difficulties, including lack of flexible and reliable characterization methods.

Altair has delivered a large-scale industrial process that can manufacture variety of nano-ceramic products possessing desirable properties. High level of complex understanding was needed to overcome the lack of super-expensive instruments and create a quality control system, which can use combination of data to observe every important event in the production effecting changes in the nanoparticle properties.

In this work we want to discuss problems associated with large scale manufacturing of variety of ceramic nano-materials such as  $\text{TiO}_2$ ,  $\text{ZrO}_2$ , variety of titanates,  $\text{LiMn}_2\text{O}_4$  and nanosized battery materials, high temperature conductive mixed oxides, catalyst support and photocatalytic nano-structures.

Using practical examples we would like to demonstrate the flexibility of our proprietary thin film technology, control of chemical composition, doping, crystal phase purity, particle size, morphology, sintering and other properties of the nano-products made in Altair process.

Figure 1.  $\text{TiO}_2$ - nano anatase of TiNano40 series. The material has been tested in many applications from photocatalysis to plasma coating.

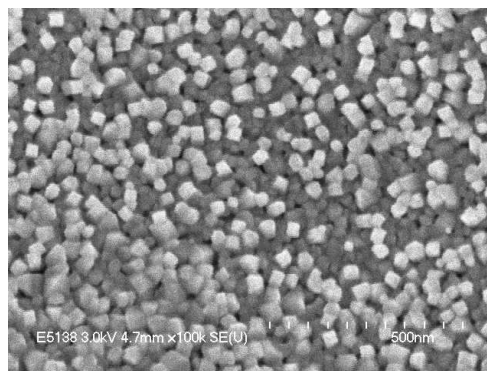


Figure 2. Altair Nanosized YSZ is used in many internal and external applications requiring high sintering properties, such as for plasma coating or SOFC electrolytes.

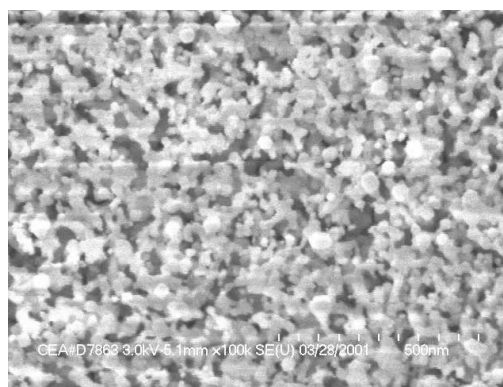


Figure 3. Nanosized lithium titanate electrode grade powder, suitable to stand charge and discharge in 5 seconds.

