

Ceria –Titania Active Non-Woven Ceramic Cloths

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A novel synthesis method of ceria-titania nanofibrous mats is reported here. A combination of sol-gel synthesis and electrospinning was employed to create self-supported, robust, fully crystalline, nanostructured, oxide mats following calcination. Use of supersaturated solutions of Ce in TiO_2 has resulted in non-woven Ce-Ti oxide nanofibers of 50nm average diameter, as confirmed by high energy electron imaging and diffraction. Ce-Ti oxide micro-cubes decorate the surfaces of the nanofibers. The cube crystals are foam-like monolith structures.

The ceria-titania mats are macroscopic “ceramic fabrics” consisting of non-dispersed nanomaterials. They also have unique and advanced structural and chemical characteristics (shape and size dependent) tailored by the novel synthesis method employed here.

These novel ceramic materials may be used as wearable sensors and advanced catalysts.

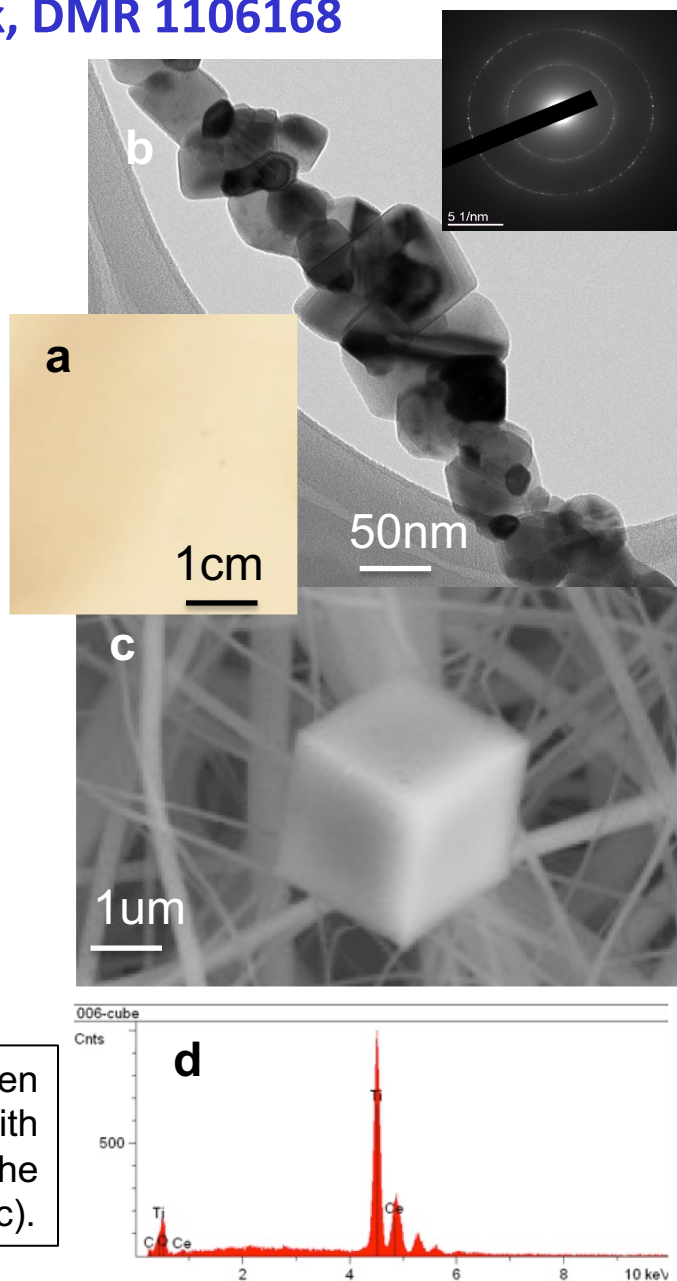


Figure Caption: **a**. Macroscopic appearance of the non-woven nanofibrous ceramic cloth; **b**. TEM image of a single nanofiber with corresponding electron diffraction pattern; **c**. SEM image of the cloth's structure; **d**. EDS analysis of the cube monolith shown in (c).