

Title (en)  
REDUCED GRAIN BOUNDARY CRYSTALLINE THIN FILMS

Title (de)  
KRISTALLINER DÜNNSCHICHTFILM MIT VERRINGERTER KORNGRENZE

Title (fr)  
COUCHES MINCES CRISTALLINES A JOINT DE GRAIN REDUIT

Publication  
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Application  
**EP 01958938 A 20010713**

Priority

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Abstract (en)  
[origin: WO0207966A1] Reduced grain boundary (RGB) thin films for use as electrolytes in solid oxide fuel cells (SOFC), gas separation membranes or dielectric material in electronic, photonic, radio frequency and pyroelectric devices, are disclosed. By using CCVD, CACVD or any other suitable deposition process, RGB films having pore-free, ideal grain boundaries, and dense structure can be formed. In addition, the use of RGB thin films for electrolytes and electrode formation in SOFCs results in densification for pore-free and ideal grain boundary/interface microstructure. Gas separation membranes for the production of oxygen and hydrogen are also disclosed. These semipermeable membranes are formed of high-quality, dense, gas-tight, thin film layers of mixed-conducting oxides on porous ceramic substrates. RGB thin films as dielectric material in capacitors are also taught herein. Capacitors are utilized according to their capacitance values which are dependent on their physical structure and dielectric permittivity. The RGB thin films of the current invention form low-loss dielectric layers with extremely high permittivity. This high permittivity allows for the formation of electronic, photonic, etc. devices that can have their properties adjusted by applying a DC bias between their electrodes.

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