



Ceria-Based Electrolytes

Ceria-based electrolytes offer many advantages over traditional zirconia-based YSZ electrolytes, notably higher conductivities at lower operating temperatures and compatibility with high performance cathode materials. Fuel Cell Materials offers a full line of ceria-based electrolyte materials for solid oxide fuel cell and ceramic oxygen generators. The incorporation of ceria into SOFC anodes and cathodes enhances electro-catalytic activity and provides a viable path toward internal reforming and/or direct utilization of hydrocarbon fuels. Ceria electrolyte compositions (doped with gadolinium or samarium) are offered as nanoscale powders for use in colloidal deposition processes and/or electrode additives, and as ceramic grade powders tailored for pellet pressing and/or tape casting processes. The nanoscale ceria electrolyte materials are available as 100 mesh powders. Additional doped ceria formulations compositions can be produced to your specifications.

Applications

- SOFC electrolytes (up to 700°C)
- Electrolyte for oxygen generation systems
- Additives for anodes and cathodes
- Interlayers for high performance SOFCs

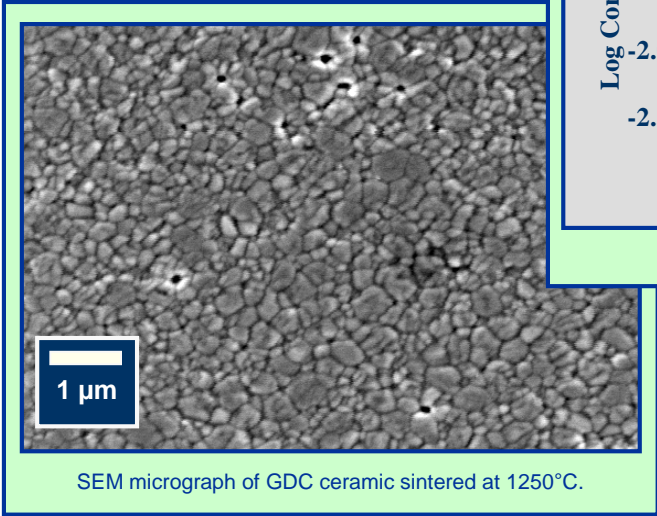
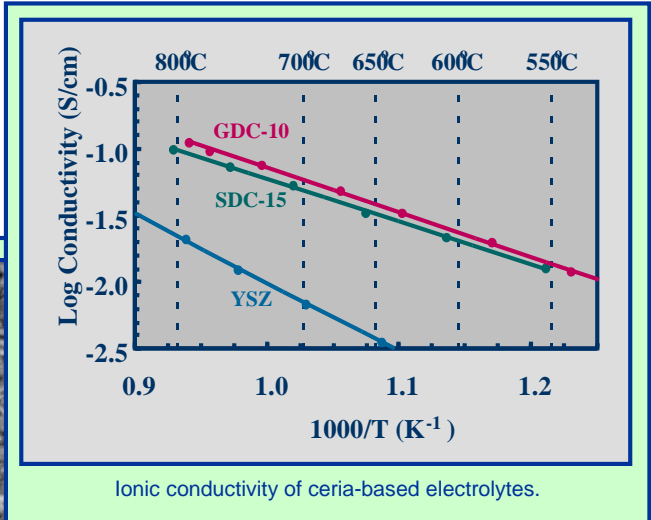
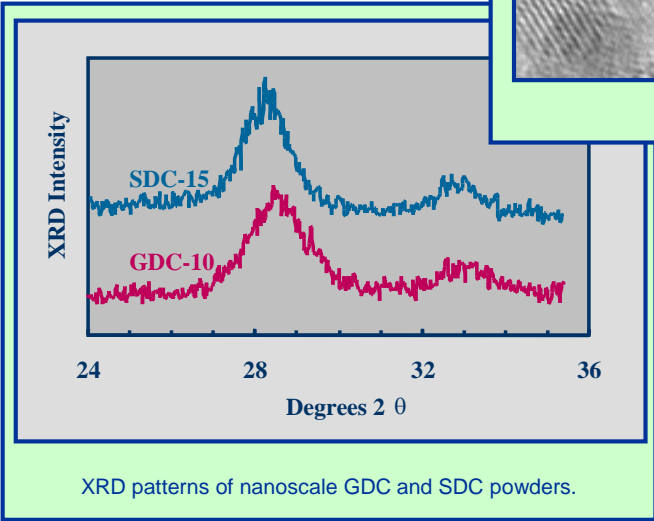
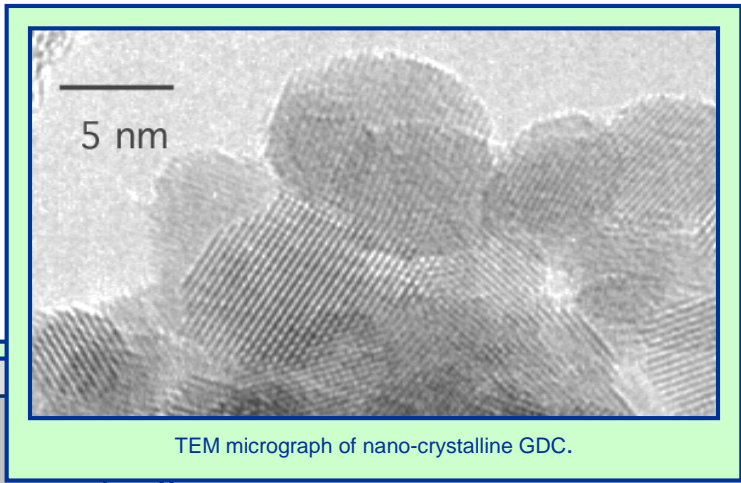
Benefits

- Higher ionic conductivity than YSZ for better results at lower operating temperature
- Chemical inertness and thermal expansion match with high performance cathode materials such as LSCF and SSC
- Enhanced performance when used in composite electrodes
- High crystalline-phase and chemical purity

Materials and Properties	
Standard Compositions *	GDC10: $(\text{Ce}_{0.90}\text{Gd}_{0.10})\text{O}_{1.95}$ GDC20: $(\text{Ce}_{0.80}\text{Gd}_{0.20})\text{O}_{1.9}$ SDC15: $(\text{Ce}_{0.85}\text{Sm}_{0.15})\text{O}_{1.925}$ SDC20: $(\text{Ce}_{0.80}\text{Sm}_{0.20})\text{O}_{1.9}$
Crystal Structure	Single-Phase Fluorite
Ionic Conductivity	$\sigma > 0.015 \text{ S/cm @ } 600^\circ\text{C}$
Thermal Expansion (25 to 1000°C)	GDC: $\alpha = 13.4 \text{ ppm}/^\circ\text{C}$ SDC: $\alpha = 12.7 \text{ ppm}/^\circ\text{C}$
* Custom formulations available	

Product Specifications		
Specification	Nanoscale Grade	Ceramic Grades
Crystallite Size	5-10 nm	--
Particle Size	-60 mesh	0.3-0.5 μm (d50)
Surface Area	>100 m^2/gram	5-8 m^2/gram 30-40 m^2/gram
Sintering Temperature	1200 to 1250°C	1300 to 1400°C

sales@fuelcellmaterials.com | (614) 842.6606 | fax (614) 842.6607



The values reported on this data sheet are to be considered typical and do not imply essential representation of the product specification. The information contained herein is believed to be accurate and reliable but is presented without guarantee or implied warranty of merchantability or fitness on the part of fuelcellmaterials.com. Further, nothing presented herein should be interpreted as an authorization or inducement to infringe any relevant patent. Under no circumstances shall fuelcellmaterials.com be liable for direct, incidental, consequential or other damages regardless of legal theory, arising out of the use or handling of the product or products referred to herein. The sole remedy of the buyer for any claims shall be limited to the buyer's purchase price. Technical advice is accepted at the buyers risk and is not a warranty.