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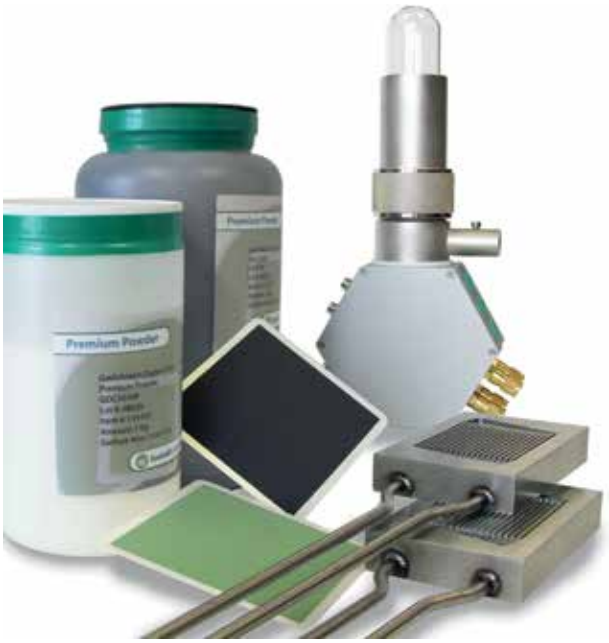
MATERIALS
FUEL CELLS

Neyco and fuelcellmaterials.com are the premier source for solid oxide fuel cell materials, components, test fixtures and fabrication aides. Our technology, quality and customer support have made us a leader in the fuel cell industry. Backed by our expertise, research and industry knowledge we specialize in providing the highest quality solid oxide fuel cell and fuel processing products to our clients.



Electrolyte Powders

NANOSCALE ELECTROLYTE POWDERS

Nano grade electrolyte powders offer truly nanocrystalline materials with 5 to 10 nanometer particles. Nano grade powders offer tremendous amounts of active surface area per volume of materials, helping extend triple-phase boundaries and lower processing temperatures. We have the processing knowledge to tailor these materials for specific customer materials.

- Using processing techniques that deliver a high purity reproducible electrolyte powder.
- Designed for electrochemical applications.
- Designed as a sintering aid, catalyst support, or a component for mixed conducting anodes and cathodes to enhance catalytic activities.

P/N	PRODUCT NAME	FORMULATION	SURFACE AREA	CRYSTALLITE SIZE	QUANTITIES
111101	GDC-10 Nano Grade	$Gd_{0.10}Ce_{0.90}O_{1.95}$	> 100 m^2/g	5-10 nm*	150 g 500 g 1 kg 5 kg
111102	GDC-20 Nano Grade	$Gd_{0.20}Ce_{0.80}O_{1.95}$	> 100 m^2/g	5-10 nm*	
111202	SDC-20 Nano Grade	$Sm_{0.20}Ce_{0.80}O_{1.95}$	> 100 m^2/g	5-10 nm*	
111301	YSZ8 Nano Grade	$(Y_2O_3)_{0.08}(ZrO_2)_{0.92}$	> 100 m^2/g	5-10 nm*	

*Crystallite size is an approximation based on surface area calculations.

PREMIUM ELECTROLYTE POWDERS

Premium grade electrolyte powders are designed to provide high performance materials with wide processing flexibility. Premium Powders provide lab researchers with the confidence that their research has a foundation in proven, industrially scaled and traceable powders, while providing developers and manufacturers with a scalable high quality powders to aid in commercialization.

- Industry-standard material formulations to provide high end performance and a baseline for materials development and optimization studies.
- Tailored for enhanced sinterability, and lower processing temperatures to provide you the widest possible processing options.
- Batch-to-batch reproducibility and traceability.
- Industry leading characterization and reporting to speed your research and development cycles.

P/N	PRODUCT NAME	FORMULATION	SURFACE AREA	PSD (d50)	QUANTITIES
114101	GDC-10 Premium Grade	$Gd_{0.10}Ce_{0.90}O_{1.95}$	10.0 - 14.0 m^2/g	0.10 - 0.50 µm	500 g 1 kg 5 kg
114201	SDC-20 Premium Grade	$Sm_{0.20}Ce_{0.80}O_{1.95}$	10.0 - 14.0 m^2/g	0.10 - 0.50 µm	

CERAMIC GRADE CERIA POWDERS

We offer Gadolinium and Samarium doped Ceria powders in two grades. The Tape Cast grade is tailored for processes that require high slurry solids loading, such as tape or slip casting. The Mid grade is made to provide excellent sinterability at lower processing temperatures. These powders are also suitable for pellet pressing and other non-aqueous manufacturing processes.

- We have the ability to make material in larger quantities than what we currently offer.
- Custom formulations and/or physical specification changes are available.

P/N	PRODUCT NAME	FORMULATION	SURFACE AREA	PSD (d50)	QUANTITIES
112101	GDC-10 TC Grade	$Gd_{0.10}Ce_{0.90}O_{1.95}$	5 - 8 m^2/g	0.3 - 0.5 µm	150 g 500 g 1 kg 5 kg
112102	GDC-20 TC Grade	$Gd_{0.20}Ce_{0.80}O_{1.95}$	5 - 8 m^2/g	0.3 - 0.5 µm	
112202	SDC-20 TC Grade	$Sm_{0.20}Ce_{0.80}O_{1.95}$	5 - 8 m^2/g	0.3 - 0.5 µm	
113101	GDC-10 M Grade	$Gd_{0.10}Ce_{0.90}O_{1.95}$	30 - 40 m^2/g	0.3 - 0.5 µm	
113102	GDC-20 M Grade	$Gd_{0.20}Ce_{0.80}O_{1.95}$	30 - 40 m^2/g	0.3 - 0.5 µm	
113202	SDC-20 M Grade	$Sm_{0.20}Ce_{0.80}O_{1.95}$	30 - 40 m^2/g	0.3 - 0.5 µm	

MICRON-SUBMICRON ELECTROLYTE POWDERS

We offer a broad selection of micron to submicron electrolyte powders, including Yttrium-stabilized Zirconia (YSZ) and LSGM. YSZ is a purely ionic conductive electrolyte over a wider range of oxygen partial pressures, which finds wide applicability in SOFCs, oxygen generation systems and sensors.

- YSZ TC is our most popular grade for tape casting electrolyte material for SOFCs due to its ideal surface area and particle size distribution.
- Coarser YSZ powders are tailored for the production of high porosity electrodes with stable microstructure.
- LSGM offers high conducting properties at intermediate operating temperatures while providing stability.
- Custom formulations and/or physical specification changes are available.

P/N	PRODUCT NAME	FORMULATION	SURFACE AREA	PSD (d50)	QUANTITIES
312005	YSZ8 TC Grade	$(Y_2O_3)_{0.08}(ZrO_2)_{0.92}$	6 - 9 m^2/g	0.5 - 0.7 µm	150 g 500 g 1 kg
312006	ScCeSZ TC Grade	$(Sc_2O_3)_{0.1}(CeO_2)_{0.01}(ZrO_2)_{0.89}$	10 - 12 m^2/g	0.5 - 0.7 µm	
312007	Sc10SZ TC Grade	$(ZrO_2)_{0.90}(Sc_2O_3)_{0.10}$	8 - 11 m^2/g	0.5 - 0.7 µm	
312008	YSZ8-U35 Standard Grade	$(Y_2O_3)_{0.08}(ZrO_2)_{0.92}$	1 - 3 m^2/g	3.0 - 5.0 µm	
312009	YSZ8-U1 Fine Grade	$(Y_2O_3)_{0.08}(ZrO_2)_{0.92}$	9 - 14 m^2/g	0.3 - 0.5 µm	
312021	YSZ8 Spray Dried	$(Y_2O_3)_{0.08}(ZrO_2)_{0.92}$	13 - 19 m^2/g	-	
312022	YSZ8-U5 Mid Grade	$(Y_2O_3)_{0.08}(ZrO_2)_{0.92}$	3 - 7 m^2/g	0.9 - 1.2 µm	
121501	LSGM TC Grade	$La_{0.80}Sr_{0.20}Ga_{0.80}Mg_{0.20}O_{3-x}$	4 - 8 m^2/g	0.3 - 0.6 µm	
312013	Sc6Al1SZ TC Grade	$(Sc_2O_3)_{0.06}(Al_2O_3)_{0.01}(ZrO_2)_{0.93}$	8 - 10 m^2/g	0.5 - 0.7 µm	
312014	Sc10Al1SZ TC Grade	$(Sc_2O_3)_{0.10}(Al_2O_3)_{0.01}(ZrO_2)_{0.89}$	8 - 12 m^2/g	0.5 - 0.7 µm	

neyco

30 avenue de la Paix
92170 Vanves - France
Tel: +33(0)1 41 90 50 50
Fax: +33(0)1 41 90 50 51

www.neyco.fr

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