LUXFER
MEL TECHNOLOGIES

DATASHEET • 1099

Nano Dispersions for Advanced Applications

Luxfer nano dispersions – General properties

- Aqueous dispersion of mixed oxide
- 20-35 wt.% oxide
- pH 3–8, composition dependent
- Contain no organic additives, or stabilizers
- Small particle size; Z-average 100–300 nm
- Low viscosity; <100 cps
- Long-term stability; >1 year
- Highly crystalline

Range of compositions (dopants) available

Table 1.

Dried properties	SA (m^2/g)	TPV (cm^3/g)	Crystallite size (nm)
Zr nano	90	0.16	12
LaZr nano	130	0.18	7.7
CeZr nano	170	0.18	5.3

Some example nano compositions (undoped/doped). Many other dopants worked with, including multi-dopant combinations.

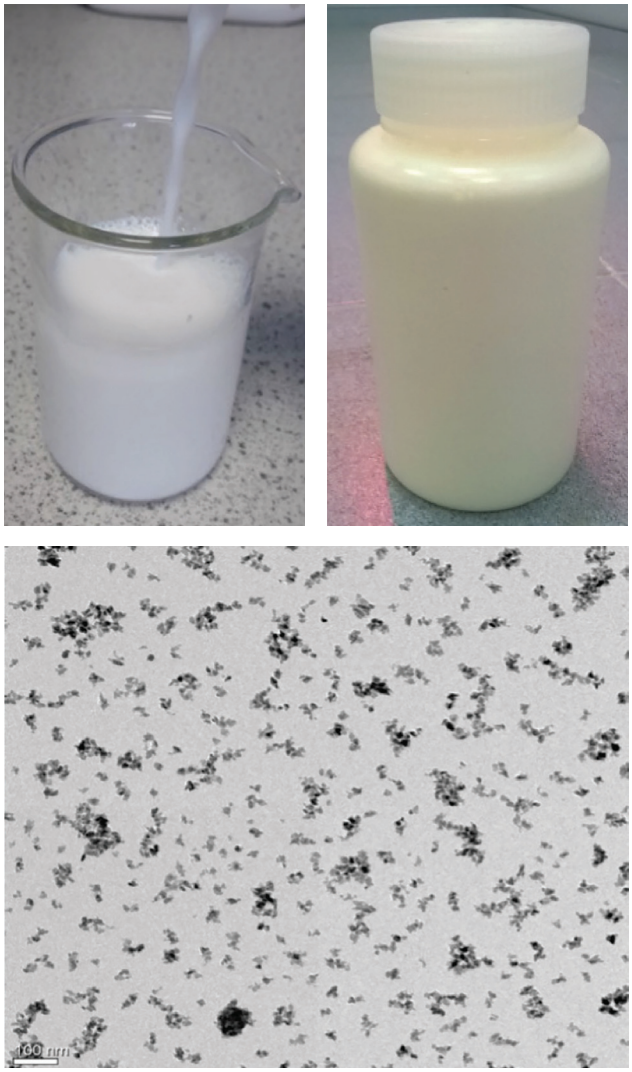

Figure 1. Example TEM image, showing polydispersity

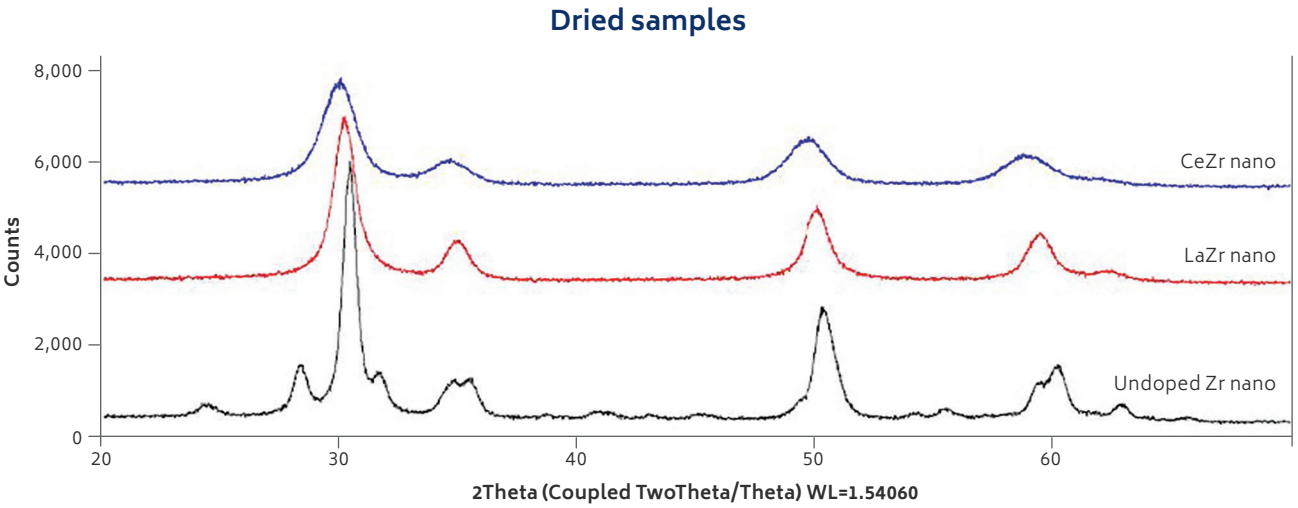

Figure 2.

Phase depends on composition.

Luxfer nano dispersions – Potential applications

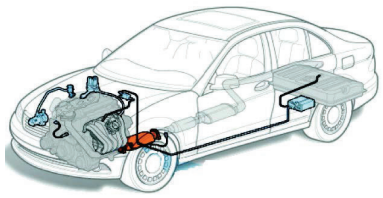

Figure 3. Emission control

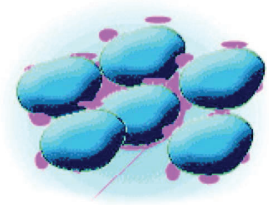

Figure 4. Binder

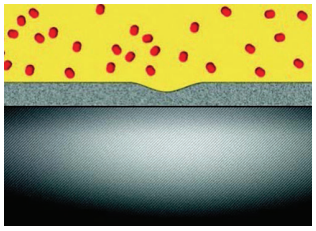

Figure 5. Coating/composite

Application example – Filters (DPF/GPF)

- Coating applied to filter substrate, to provide:
  - Catalytic performance
  - Improved particle filtration efficiency
  - Maintain acceptable back pressure within the exhaust system
- Nano dispersion shows a more homogenous/ denser coating
- TWC/OSC compositions are also available for GPF applications
  - CeZrOx mixed oxides containing additional dopants (e.g. La_2O_3, Nd_2O_3, Y_2O_3, Pr_6O_{11})

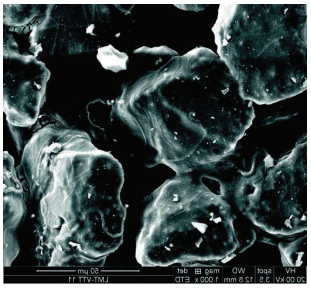

Figure 6. CePrZrOx (nano) on SiC filter

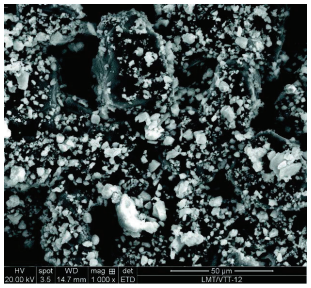

Figure 7. CePrZrOx (milled oxide) on SiC filter

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