

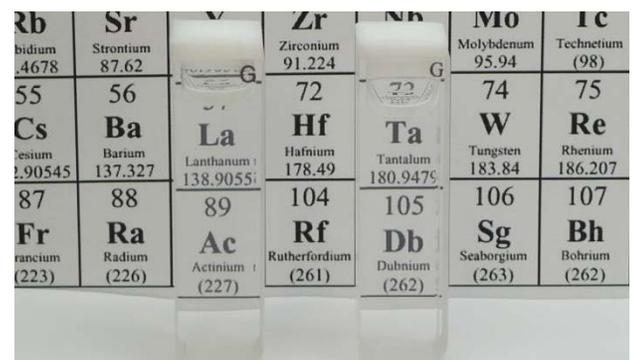


Pixelligent offers a starter 4-pack of uniquely capped nanocrystals dispersed in PGMEA (propylene glycol monomethyl ether acetate). Zirconia nanocrystals significantly increase refractive indices up to 1.85 in many polymers used for optoelectronic products. PixClear® dispersions deliver the benefits of zirconia including high transparency (>95%), hardness, and low haze (<0.5%) in coatings. The materials are solution-processable, for simple manufacturing scale-up, and compatible with existing high-volume application methods.

The PixClear® 4-pack includes PR, PB-2, PG-2, and PN capped nanocrystals dispersed to 50 wt% in PGMEA. Each capping agents has slightly different chemical properties that aid compatibility with many polymers including acrylics, siloxanes, and epoxies. PCPR-50-PGA and PCPB-2-50-PGA are designed to crosslink with acrylics when cured.

PixClear® Zirconia nanocrystals

- Loadings high as 90% in many monomers and polymers
- Remain dispersed with a shelf life over 6 months
- Dramatically increase refractive index greater than 1.8
- Maintain transparency and minimize viscosity gain

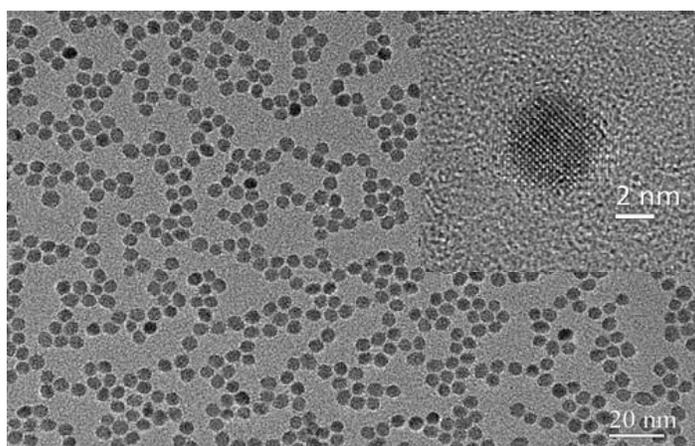


Left: 50wt% ZrO₂ Nanocrystals | Right: Pure Xylenes

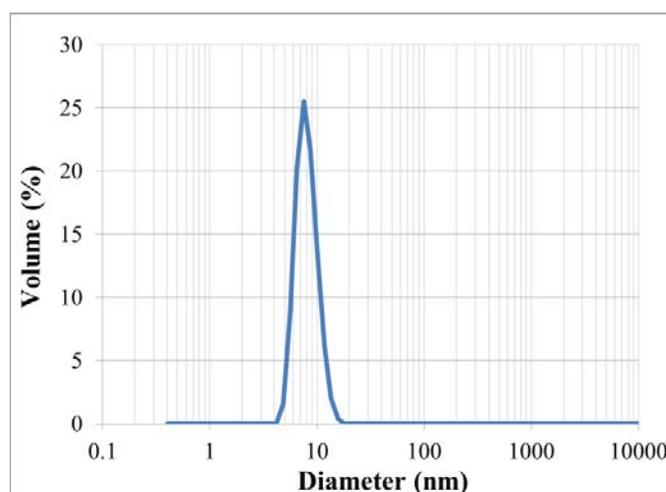
PixClear® dispersions in PGMEA

Typical Physical Properties

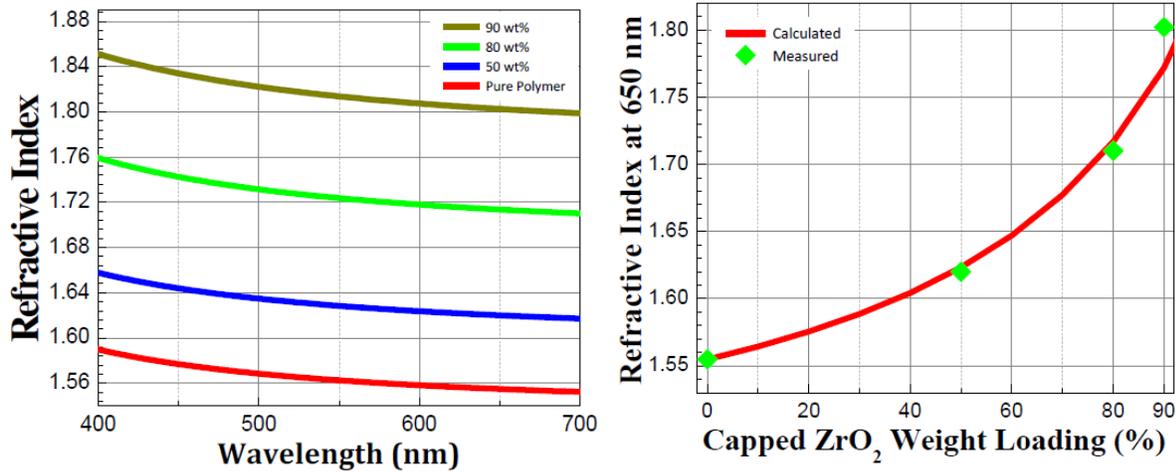
Particle Size: A typical TEM pattern shows spherical nanocrystals with 5 nm diameter and a crystalline structure (inset).



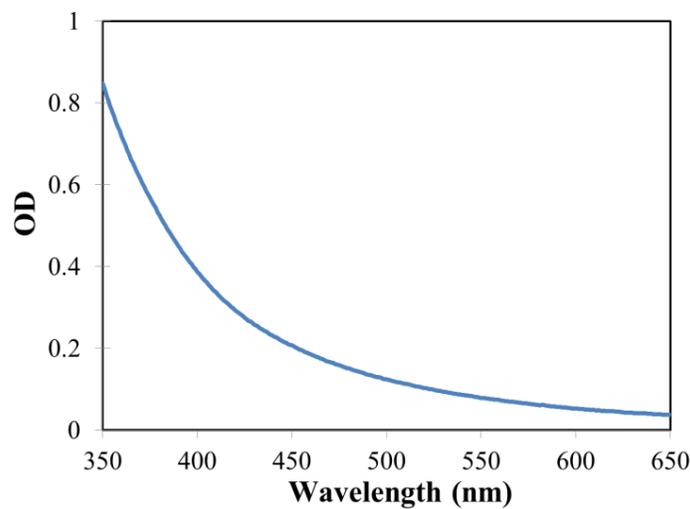
Particle Size Distribution: The dispersions are aggregate free with 99.99% (by volume) of the zirconia contained in nanocrystals with a diameter < 30 nm as measured by Dynamic Light Scattering (DLS).



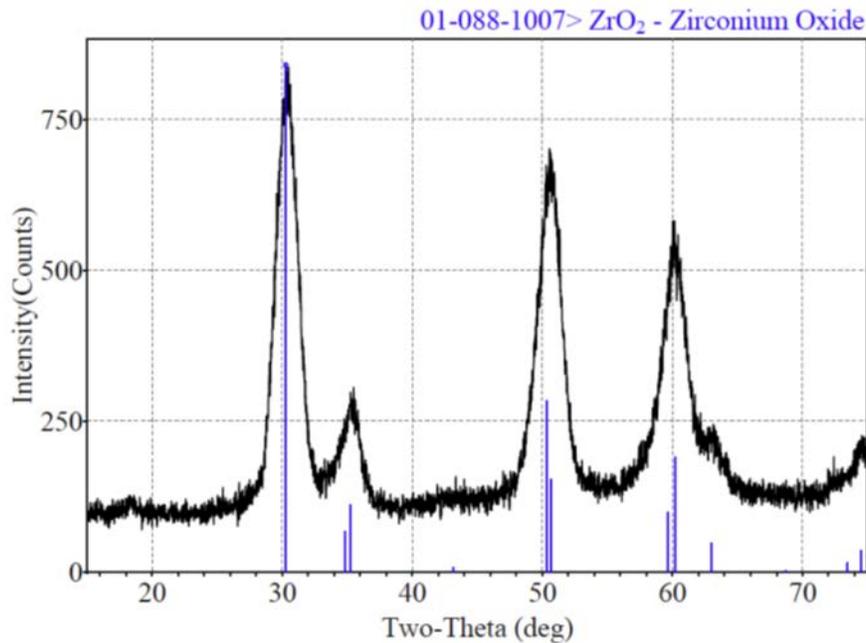
Refractive Index: In a representative acrylic polymer matrix the refractive index reaches as high as 1.85 at 400 nm with the addition of PixClear®.



UV-Vis Spectrum: A typical UV-Vis spectrum of solvent dispersion shows low absorbance and scattering in the suspension through a 1 cm path length even at 50 wt% loading in a solvent.



XRD Pattern: A typical XRD pattern shows highly crystalline particles.



Pixelligent produces the world’s best zirconia dispersion technology, enabling our customers to meet the most ambitious performance goals set for their optoelectronic systems. Light extraction and management strategies incorporating PixClear® nanocrystals benefit from control of refractive index without sacrificing transparency or physical stability.

With broad material compatibility, ease of formulation, and proven application engineering expertise Pixelligent offers unmatched value through its advanced materials.

About Pixelligent Technologies, LLC

Pixelligent Technologies is an advanced materials company that is leveraging nanotechnology to deliver the next generation of high-index materials for solid-state lighting and optical coatings and films applications. Pixelligent's PixClear® zirconia dispersions deliver the highest refractive index, transparency and stability and can be easily incorporated into the most commonly used polymers, including silicones, acrylics, and epoxies using industry standard manufacturing processes. For more information on Pixelligent, please visit www.pixelligent.com or follow us on Twitter [@Pixelligent](https://twitter.com/Pixelligent).