

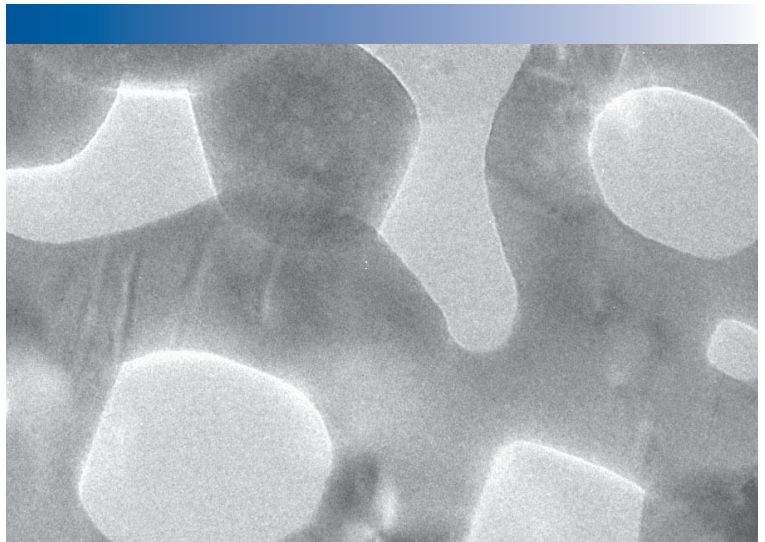
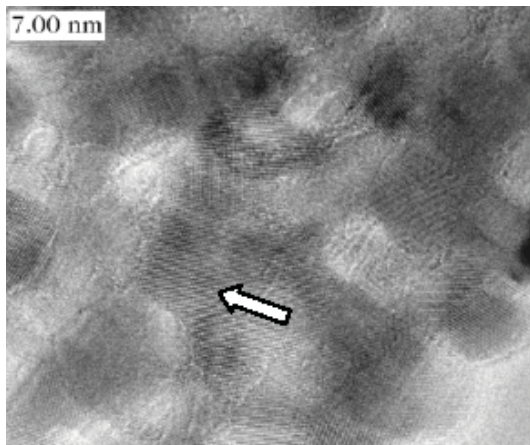
Zinc Oxide

NanoActive ZnO is produced using proprietary processes to obtain high specific surface area, small crystallite size material that can be dispersed in various carrier fluids with significantly reduced particle sizes (the volume weighted mean is below 0.3 μm).

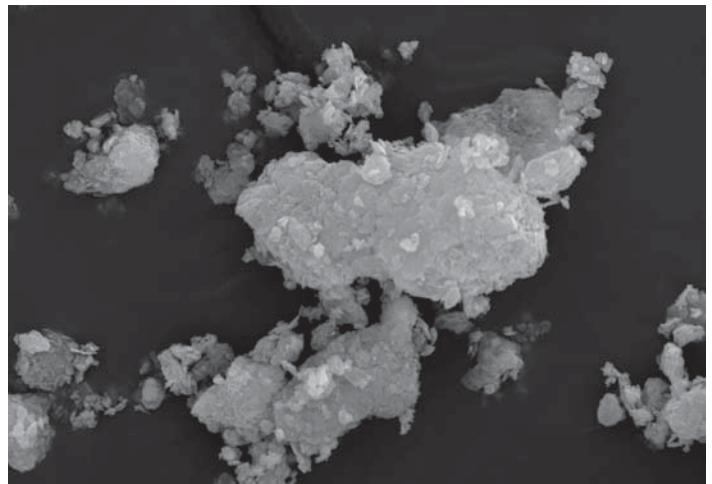
Typical Properties

Appearance/Color	Off-White Powder
Specific Surface Area (BET)	$\geq 70 \text{ m}^2/\text{g}$
Crystallite Size	$\leq 10 \text{ nm}$
Average Pore Diameter	170 \AA
Total Pore Volume	$\geq 0.2 \text{ cc/g}$
Bulk Density	0.6 g/cc
True Density	5.6 g/cc
Mean Aggregate Size, d0.5	4 μm
Loss on Ignition	$\leq 4\%$
Moisture Content	$\leq 2\%$
Zn Content (Based on Metal)	$\geq 99\%$

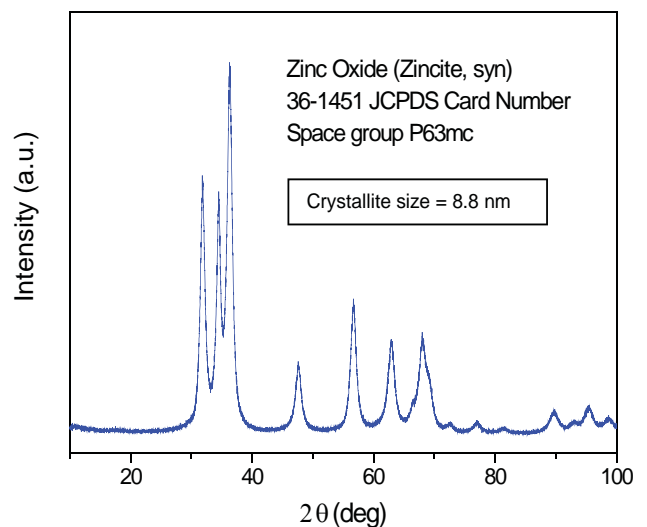
Transmission Electron Microscopy Image



Scanning Electron Microscopy Image



Powder X-ray Diffraction Spectrum



NanoActive materials exhibit a wide array of unusual properties. One of the unusual features is enhanced surface chemical reactivity. Just a few grams of a NanoActive material can have the surface area equivalent to that of a football field. Our NanoActive-S (suspensions) and NanoActive-G (granules) series provide the ability to adjust density and flow characteristics without compromising the high chemical reactivity of our NanoActive products.

Potential Applications	Nanotechnology Benefit
Catalysts and catalyst supports <ul style="list-style-type: none"> Methanol synthesis catalyst 	Increased activity due to smaller particle size and higher surface area Higher loading and better dispersion of the active species due to the high surface areas of the support Increased selectivity due to defined pore structure of the support Increased wear resistance
Cosmetic and skin care market <ul style="list-style-type: none"> Sunscreens, moisturizers, color foundations, lipstick and lip balm with SPF, medicated creams, deodorants 	Improved UV, chemical and antimicrobial protection improved odor elimination due to higher surface area
Paints and Coatings <ul style="list-style-type: none"> Biocidal (mold-growth inhibitor, antibacterial) 	Enhanced biocidal characteristics due to higher surface area Higher coverage per unit mass due to lower density Improved transparency due to small particle size
Solar cells <ul style="list-style-type: none"> Nanostructured ZnO Electrodes 	Improved light-to-energy conversion efficiencies
Transparent UV resistant coatings	Better physical optical properties due to enhanced control over particles
Varistors	Smaller grains and increased number of grain boundaries leading to better performance Miniaturization and weight decrease of the varistor

Depending on Customer-specific needs NanoScale can supply its products as dry unfunctionalized powders, compacted powders (granules) or dispersions in various carrier fluids. The custom designed materials can be tested and characterized to meet Customer requirements.

Order

Product	Catalog Number	Quantity
NanoActive ZnO	AC005-0025-00NS	25 grams
	AC005-0100-00NS	100 grams
	AC005-1000-00NS	1 kilogram
NanoActive-G ZnO	AC305-0025-00NS	25 grams
	AC305-0100-00NS	100 grams
	AC305-1000-00nS	1 kilogram
NanoActive-S ZnO	AC018-0500-00NS	500 mL