



# Borhan Nano Scale Innovators Knowledge-Based Co.

## Zinc Oxide (ZnO) Nanoparticles

### Introduction

ZnO nanopowder is a metal oxide that is an n-type direct band semiconducting material with a band gap of 3.37 eV.

### Specifications

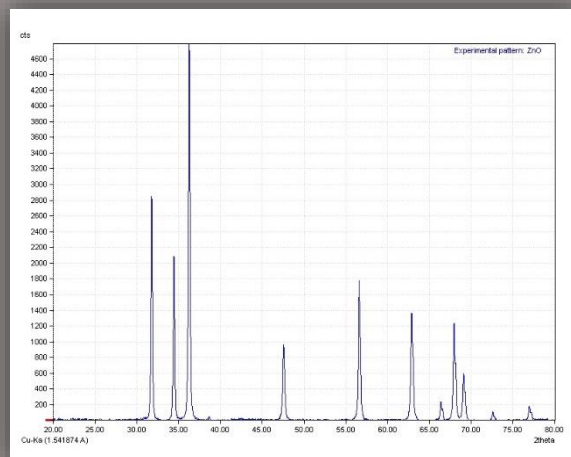
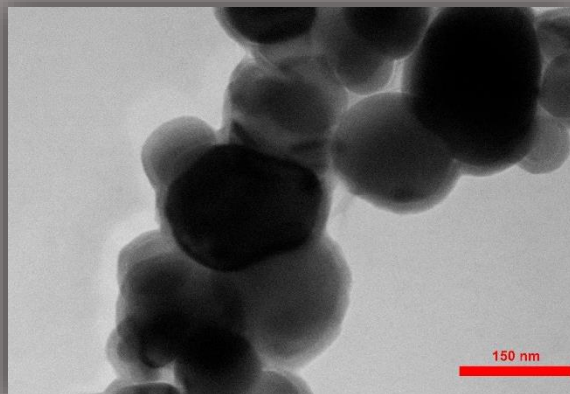
Molecular formula	ZnO
Molecular weight	81.39
Morphology	Spherical
Color	White
Size (nm)	Less than 70
Form	Nanopowder
CAS No.	1314-13-2

### Applications

- Antibacterial and Anti-corrosion layers, and Antifungal filters
- Electronics, optoelectric, electrical and photoelectronic devices
- Optical devices and detectors
- Photovoltaics
- Medicine and Pharmacy
- Gas sensors ( $\text{NH}_3$ ,  $\text{O}_3$ ,  $\text{CO}$ ,  $\text{H}_2$ ,  $\text{N}_2\text{O}$ ,  $\text{O}$ ,  $\text{C}_3\text{H}_8$ ,  $\text{C}_2\text{H}_5\text{OH}$  and  $\text{CH}_2\text{O}$ )
- Piezoelectric materials
- Cosmetics (Sunscreens, Nail products, Shampoos and Soaps)
- Food products, Additives and Edible colors
- Lubricants (High temperature lubricant in gas turbine engines)
- Fabric, Tool, Paint, Tire, Rubber, Ceramic, tile and glazing industries
- Varistor (Voltage Dependent Resistors)
- Photodiodes and laser diodes
- Ultraviolet laser
- Fire extinguishing and Fireproof coatings
- Concrete, Cement, Glass, Adhesives, Magnets, Transparent plastics and plastic glass or films, Nanocomposites, Waxes, Hydrophobic materials, Catalyst in petrochemicals, Solar Cells and Atomic force microscopes (AFM)
- Elimination of environmental and photocatalytic pollution
- Animal feed and Agricultural fertilizers
- Wooden products
- Batteries and Energy storage devices

### Advantages

- Antibacterial
- Relatively high chemical stability and photostability
- Anti-UV radiation
- Pyro and piezoelectric
- Semiconductor
- Biodegradable with low toxicity
- High thermal conductivity
- Insoluble in water and alcohol
- Being an amphoteric oxide (can act as both a base and an acid)



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