

# Structural, microstructural and thermal characterization of Fe- doped ZnO powder nanostructures prepared by mechanical alloying

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**Abstract:** ZnO powder nanoparticles mechanically alloyed were doped with iron to investigate their structural and microstructural properties using X-ray diffraction (XRD) and differential scanning calorimetry (DSC) for examined 1% Fe doped ZnO. The ZnO starting pure powder exhibited a hexagonal crystal structure with space group  $P6_3mc$  of ZnO, however with the introduction of 1% Fe in the ZnO milled powder, the hexagonal ZnO phase remained unchanged, whereas the microstructural parameters were subject to significant variations due to the introduction of Fe atoms into the ZnO hexagonal matrix to replace oxygen ones. The size of crystallites and microstrains are found milling time dependent.

**Keywords :** ZnO, XRD, DSC