

Mössbauer Studies of $\text{BaCoZnFe}_{16}\text{O}_{27}$ W-type Hexaferrite

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A polycrystalline $\text{BaCoZnFe}_{16}\text{O}_{27}$ sample was prepared by the solid-state reaction method and wet ball-milling. The refined X-ray diffraction patterns revealed that the prepared sample was hexagonal with the space group $P6_3/m$. To determine the spin transition temperature (T_S), the temperature dependence of the zero-field-cooled magnetization curves were measured under applied fields of 100 to 1000 Oe at various temperatures ranging from 4.2 to 295 K. T_S is the temperature at which the spin changes from the planar to the conical direction at the 135 K. From the hysteresis curves at various temperatures ranging from 4.2 to 295 K, the coercivity showed a change in slope at T_S . Mössbauer spectra were obtained at various temperatures ranging from 4.2 to 295 K, and the magnetic hyperfine field and electric quadrupole splitting of the sample showed abrupt changes around T_S .

Keywords : W-type hexaferrite, Mössbauer spectroscopy, spin transition