

METAMAGNETISM IN COBALT DITHIOCYANATE DIMETHANOL

Cobalt dithiocyanate dimethanol is a member of a family of compounds, $M(\text{SCN})_2(\text{ROH})_2$, studied by us for some time. Recent work on mixed magnetic iron/nickel dichloride dihydrate and the metamagnetism observed in it prompted reexamination of the cobalt system. The magnetic susceptibility is highly anisotropic and analysis shows it consistent with three-dimensional Ising model behavior. Surprisingly, the strongest interaction, within metal-thiocyanate layers, is ferromagnetic; this is in contrast to most previously examined members of this series. Weaker antiferromagnetic exchange interactions occur between the layers. This scenario yields the observed metamagnetism, most evident in magnetization vs field isotherms along the easy axis shown in the accompanying graphic. Along two orthogonal crystal directions much weaker field induced transitions are seen. Spin reorientations associated with a multi-sublattice spin structure involving hidden canting is the likely explanation for this rather unusual phenomenon.