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Synthesis of some transition metal (M: ^{25}Mn , ^{27}Co , ^{28}Ni , ^{29}Cu , ^{30}Zn , ^{47}Ag , ^{48}Cd) sulfide nanostructures by hydrothermal method

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Abstract

The design of nanostructures with favored shape, particle size and structure is one of the most important fields of nanoscience. To reach this target hydrothermal method is one of the most applicable methods which allow us to obtain favored structures by changing some parameters. This review focuses on synthesis of some transition metal sulfides by hydrothermal method because of technological importance of this group of material. The common sulfides of Mn, Co, Ni, Cu, Zn, Ag and Cd are introduced and a mechanism proposed for their synthesis. The effects of temperature and time reaction, surfactant, reactants concentration, metal and sulfur sources and etc. on the morphology, particle size and some properties of the products are investigated. SEM and TEM images show the morphology and size of the as-synthesized samples. Chemical composition of the samples is characterized by XRD, EDS and etc. The magnetic, optical and thermoelectric properties of the metal sulfides are investigated.

Keywords: Nanostructures; Hydrothermal; Metal sulfide; Synthesis.

1. Introduction

Nanotechnology is the ability to measure, design, and manipulate at the atomic, molecular and supramolecular levels on a scale of about 1 to 100 nm in an effort to understand, create, and use material structures, devices, and

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