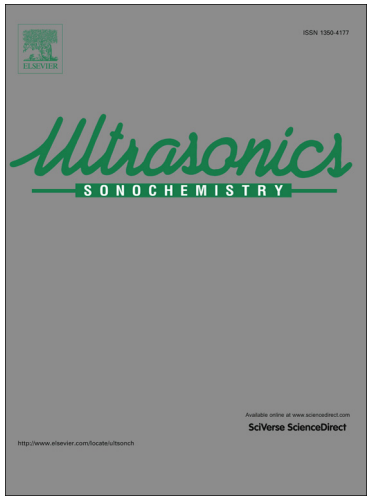

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Payam Abdolalian, Ali Morsali, Giuseppe Bruno

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Sonochemical synthesis and characterization of microrod to nanoparticle of new mixed-ligand zinc(II) fumarate metal-organic polymer

Payam Abdolalian[a], Ali Morsali[a*] and Giuseppe Bruno[b]

[a] Department of Chemistry, Faculty of Sciences, Tarbiat Modares University, P.O. Box 14115-175, Tehran, Iran

[b] Università degli Studi di Messina, dip. Scienze Chimiche, Viale Ferdinando S. d'Alcontres, 98166 Messina, Italy

E-mail: Morsali_a@modares.ac.ir

Abstract

Micro and nano-structures of a new mixed-ligand Zn(II) fumarate metal-organic polymer, $\{[Zn(tptz)(fum)].DMF\}_n$ (**1**), (tptz = 2,4,6-tris(2-pyridyl)-s-triazine, fum = fumarate, DMF = N,N-dimethylforamide), were synthesized by sonochemical method. These new micro and nano-structures were characterized by scanning electron microscopy (SEM), X-ray diffraction (XRD), IR spectroscopy and elemental analyses. Compound **1** was structurally characterized by single-crystal X-ray diffraction and consists of the primary unit of [Zn(tptz)(fum)]. Self assembly between the units of [Zn(tptz)(fum)] from Zn-O bonds results in the formation of a one-dimensional zinc(II) coordination polymer. The Zn^{II}-ion in compound **1** has ZnO_2N_3 coordination sphere with a trigonal bipyramidal molecular geometry. Compound **1** was synthesized by ultrasound irradiation under different concentrations and times. The microrods structure of compound **1** with increasing of concentration and ultrasound radiation time were synthesized as nanoparticles structure successfully. So ultrasound radiation change morphology from microrods to nanoparticles.

Keywords: metal-organic polymer; Mixed-ligand; Microrod; Nanoparticle; Sonochemical