

TAILORING MORPHOLOGY AND MAGNETIC PROPERTIES OF CoPt₃ NANOPARTICLES PREPARED VIA REVERSE MICELLES

GH.Bahmanrokh^{1*}, M.B.Hashim^{1,2}, I.Ismayadi², I.R.Idza¹, M.S.E.Shafie², N.Rodziah¹,
A.R.Norailiana¹, A.N.Hapishah¹, M.I.Fazidah², M.Masoudi¹, M.Masni¹

¹*Department of physics, faculty of Science, University Putra Malaysia,
43400, Serdang, Selangor Malaysia,*

²*Advanced Materials and Nanotechnology Laboratory, Institute of Advanced
Technology, University Putra Malaysia, 43400, Serdang, Selangor, Malaysia*

Corresponding author: ghazalehbahmanrokh@yahoo.com

ABSTRACT

Magnetic nanoparticles with an average size of 11 nm have been prepared by using reverse micelle solutions. The effect of gold coating on the morphology and magnetic properties of cobalt-platinum nanoparticles were investigated by X-ray powder diffraction, energy dispersive x-ray, transmission electron microscopy and vibrating sample magnetometry. Nanoparticles that had useful magnetic properties needed to be protected from oxidation to avoid degrading the favorable magnetic properties. CoPt₃ nanoparticles showed a blocking temperature of 40K and coercivity of 261.6Oe. Gold coating of CoPt₃ cores with a shell thickness of 5nm further enhanced blocking temperature and coercivity to 45K and 421.1Oe respectively.

Keywords: core-shell; magnetic nanoparticles; coercivity; reverse micelle; superparamagnetism

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