INTERNATIONAL CONFERENCE ON SUPERCONDUCTIVITY AND MAGNETISM

25-30 April 2010, Antalya, TURKEY

www.icsm2010.org

The bridge between west & east in excellence of quality

ICSM 2010

Abstract Book

B20

M-P-052

Synthesis of iron-oxide nanoparticles at different temperatures

O. KARAAGAC [1], H. KOCKAR [1] and T. TANRISEVER [2]

[1] *Physics Department, Science & Literature Faculty, Balikesir University, 10145, Cagis, Balikesir,* TURKEY
[2] *Chemistry Department, Science & Literature Faculty, Balikesir University, 10145, Cagis, Balikesir,* TURKEY
hkockar@balikesir.edu.tr

Co-precipitation is one of the most wide-spread techniques to obtain nanoparticles [1]. It is used to synthesize magnetic nanoparticles from their metal salts in a basic medium in inert gas atmosphere especially nitrogen. The synthesis conditions were seen to have significant effects on the properties of nanoparticles [2]. In this study, iron-oxide nanoparticles were synthesized in air atmosphere. The influence of the temperature on their structural and magnetic properties was investigated. Crystal structure of the synthesized samples was investigated using x-ray diffraction technique. It was observed that the intensity of the peaks in the patterns and crystallinity increased as the temperature increased. As an example, the XRD pattern of the sample is given in Figure 1 and the mean crystallite size obtained from the pattern is 10.8 nm. Morphological observation was made by transmission electron microscope. The size of iron oxide nanoparticles was found closer to the one obtained from XRD pattern. Magnetization curves were measured using vibrating sample magnetometer, and the samples showed superparamagnetic behavior. The magnetic sizes calculated according to the magnetic data were almost the same for all samples.

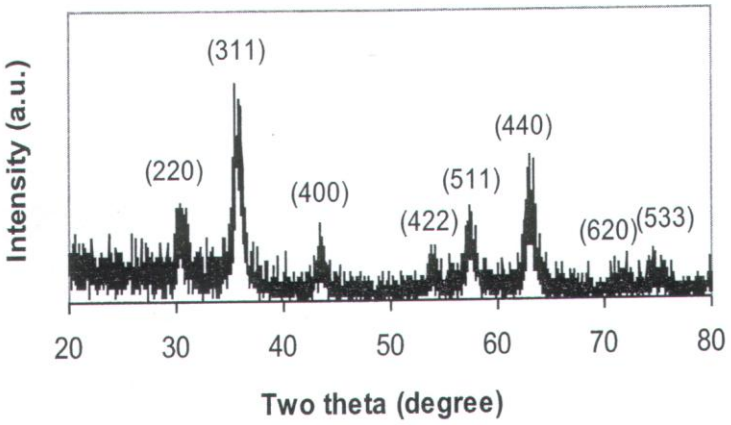

Figure 1. XRD pattern of iron-oxide nanoparticles.

[1] A.H. Lu, E. L. Salabas, F. Schüth, Angewandte Chemie Int. Ed. 46, 1222-1244 (2007).
[2] L. Babes, B. Denizot, G. Tanguy, J. J. Le Jeune, P. Jallet, Journal of Colloid and Interface Science 212, 474-482 (1999).