Electronic Letters on Science & Engineering 12 (2) (2016)
Available online at www.e-lse.org

Special Issue
BSW2016
Fifth Bozok Science Workshop: Nano Carbon Materials and Their Applications

Bozok Science Workshop 2016, Yozgat, April 28-29, 2016.

THE EFFECT OF MAGNETIZATION ON X- RAY FLUORESCENCE CROSS SECTIONS

Paşa YALÇIN [*,1], Mehmet TERZİ[2], Ali GÜROL [3]

[1] *Department of Elementary Education, Faculty of Education, 24030 Erzincan University, Erzincan, Turkey.*
[2] *Institute of Natural Sciences, Erzincan University, 24030 Erzincan, Turkey.*
[3] *Department of Physics, Faculty of Sciences, Atatürk University, 25240 Erzurum, Turkey.*

Abstract: In this study, Fe and Co tablet samples, which show ferromagnetic properties at room temperature, were magnetised for 300 seconds in a 1T (10 kG) of size magnetic field, which had 12.94 mm distance between its poles. The magnetic field applied on the ferromagnetic samples were measured as F. W. Bell Gauss/Teslameter (Model 5080) and 1 tesla (10 kG) when the distance between its poles were 12.94 mm. Then, the change emerged in the σ Kα and σ Kβ cross sections of Fe and Co were respectively measured as 20º, 40º, 60º, 80º, 100º, 120º and 140º release angles in order. The samples were alerted with KX-rays of silver alerted from Cd-109 radioisotope source of 40 mCi.

During the study, an HPGe detector, which has the beryllium window with 25μm diameter and with (FWHM) 210 eV full width at half maximum in 5.9 keV was used. The crystal thickness of this detector was 10 mm and its active field was 200 mm^2, the voltage to be used on the detector was applied till -1500 V at maximum and the shaping time were set as 10μs. The liquid, which is located in a crystal counter and FET were hold in a 30 liters of a liquid nitrogen container (dewar) was kept under nitrogen boiling temperature.

The results showed that specifically the magnetization of Fe increased its KX-ray fluorescence cross sections and the fluorescence cross sections of KX-ray fluorescence cross sections for Fe without magnetization were anisotropic although it was not encountered with any anisotropy of magnetized Fe X-rays. Consequently, this was an expected situation as the magnetised Fe and the anisotropy of

[*] *Corresponding author; Tel.: +(90) 4462240089/42239 , E-mail: pasayalcin@hotmail.com*

Co in the σ Kα and σ Kβ values were orientations of ions generated after alerted with photon, which was the anisotropy source of X-rays. However, to make the results more useful, it is necessary to make more studies that are experimental and support these results with studies determining the orientations of atoms in magnetized samples.

Keywords: *Angular Distribution; Magnetization; Cross Section; XRF; X-Rays.*