X-ray attenuation coefficients of Gd compounds in the K edge region at different energies

Ferdi Akman[1*], Mehmet F. Turhan[2], Mustafa R. Kaçal[3], Rıdvan Durak[4] and Abdulhalik Karabulut[4]

[1]*Bingöl University, Vocational School of Technical Science, Department of Electronic Communication Technology,1200, Bingöl.*
[2]*Afyon Kocatepe University, Atatürk Vocational School of Health Service, Department of Medical Imaging Techniques, 03200, Afyon.*
[3]*Giresun University, Science and Art Faculty, Department of Physics, 28000, Giresun.*
[4]*Ataürk University, Science Faculty, Department of Physics, 25240, Erzurum.*
[*] fakman@bingol.edu.tr

The total mass attenuation coefficients for element Gdand compounds Gd_2O_3, $Gd_2(CO_3)_2.H_2O$, $Gd_2(C_2O_4).H_2O$ and $Gd_2(SO_4)_3$were measured at the different energies between 39.522-57.142keV range by using secondary excitation method. Sm, Eu, Gd, Tb, Dy, Ho and Er were chosen as secondary exciter. 59.54 keV gamma rays emitted from an Am-241 annular source were used to excite secondary exciter and $K\alpha_2$, $K\alpha_1$, $K\beta_1$ and $K\beta_2$ lines emitted of secondary exciter were counted by a Si(Li) detector with a resolution of 160 eV at 5.9 keV. The validity of mixture rule was discussed around the absorption edge for compounds. Obtained values were compared with theoretical values.

***Keywords*:** Total mass attenuation coefficient, EDXRF, Mixture rule.