

Poster Presentations

Atomic and Molecular Physics (04)

**DETERMINATION OF THE K SHELL ABSORPTION JUMP FACTOR OF
MOLECULAR AND ATOMIC CROSS SECTIONS FOR SOME SAMARIUM
COMPOUNDS**

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Samarium and/or its compounds have played an important role in the production of permanent magnets. Moreover, they are used in X-ray lasers, precision guided weapons, white-noise production in stealth technology, the absorption of the infrared rays in the optical glasses, and the industries of cinema and electronics. The molecular and atomic cross sections are widely used in the study of interaction of gamma rays with matter and their accurate data require in many fields such as radiation physics, biophysics, spectrometry and crystallography.

The molecular and atomic cross sections for some samarium compounds were determined both experimentally and theoretically. The measurements were performed in a transmission geometry using the $K\alpha_2$, $K\alpha_1$, $K\beta_1$ and $K\beta_2$ X-rays from different secondary source targets excited by the 59.54 keV gamma-photons from an Am-241 annular source. A Si(Li) detector was used to count the related X-rays, in the measurements. The results were fitted linearly on the above and below region at the K edge. The absorption jump factors of molecular and atomic cross sections were determined using these fit values. The experimental results were compared with the theoretical results.