

K-alpha resonance fluorescence in multiple ionizations and possible source of monochromatic X-rays

Sultana N. Nahar

*Institution: The Ohio State University, Columbus, OH 43210, USA
e-mail: nahar@astronomy.ohio-state.edu***Abstract**

Nanoparticles are under extensive study because of very high potential for applications in various areas. In our study of x-ray absorption followed by photoelectron ejection by gold nanoparticles embedded in a tumor for possible malignant cell killing we showed that the number of electron ejection is enhanced considerably at resonant energies. These resonant energies are the positions of the 1s-2p excitations and lie below the K-shell ionization energy of gold. The excitations occur to 2p holes created by inner shell ionizations. As the ion decays, a K-alpha photon is emitted which is known as Auger process. This can lead to strong K-alpha fluorescence under high intensity laser which causes multiple ionization stages and is focused at resonant energy. The effect was observed recently in solid aluminum by the We explain this effect and predict the possibility of having a monochromatic x-ray source.