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Determination of Mass Attenuation Coefficients, Effective atomic number and Electron Density of Lumefantrine in the Energy Range 1 keV – 100 GeV

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Abstract

The effective atomic number and electron density of Lumefantrine(LU) have been calculated for total and partial photon interactions by the direct method in the wide energy range of 1 keV – 100 GeV using WinXCOM. The values of these parameters have been found to change with energy. The variations of effective atomic number and electron density with energy are calculated and shown graphically.

Keywords: LU; Mass attenuation coefficients; Effective atomic number; Electron density.

References

1. El-Kateb, A. H., & Abdul Hamid, A. S. (1991). Photon attenuation coefficient study of some materials containing hydrogen, carbon and oxygen, Applied Radiation Isotopes, 42, 303-307.
2. Gerward, L., Gilbert, N., Jensen, K. B. & Levring, H. (2001). WinXCom-a program for calculating X -ray attenuation coefficients, Radiation Physics and Chemistry, 60, 23.
3. Gerward, L., Gilbert, N., Jensen, K. B., & Levring, H. (2004). WinXCom-a program for calculating X-ray attenuation coefficients Radiation Physics and Chemistry, 71, 653-654.
4. Hyne, G. J. (1952). The effective atomic numbers of materials for various γ-ray interactions, Physics. Review, 85, 725.
5. Jackson, D. F., & Hawkes, D. J. (1981). X-ray attenuation coefficients of elements and mixtures Physics Report, 70, 169.
6. Manohara, S. R., & Hanagodimath, S. M. (2007). Studies on effective atomic numbers and electron densities of essential amino acids in the energy range 1 keV- 100 GeV. Nuclear instruments and methods in physics research *B,* 258, 321-328.
7. Manohara, S. R., Hanagodimath, S. M., & Gerward, L. (2008a). Energy dependence of effective atomic numbers for photon energy absorption and photon interaction: studies on some biological molecules in the energy range 1 keV-20 MeV. Medical Physics, 35, 388-402.
8. Perumallu, A., Nageshwararao, A. S. & Krishnarao, G. (1985). Z-dependence of photon interactions in multi-element materials, Physica B+C, 132C, 388-394.
9. Shivalinge Gowda., Krishnaveni, S., Yashoda, T., Umesh, T.K. & Ramakrishna Gowda. (2004). Photon mass attenuation coefficients, effective atomic numbers and electron densities of some thermo luminescent dosimetric compounds, PRAMANA, 63, 529–41.
10. Shastry, K. S. R., & Jnanananda, S. (1958). Journal of Scientific and Industrial Research, 17B, 389.