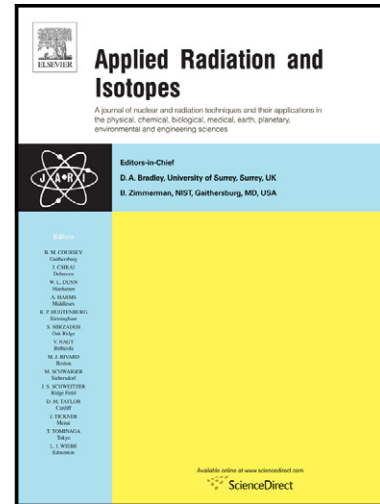


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A study of the energy absorption and exposure buildup factors of some anti-inflammatory drugs

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Abstract

Human radiation exposure is increasing due to radiation development in science and technology. The development of radioprotective agents is important for protecting patients from the side effects of radiotherapy and for protecting the public from unwanted irradiation. Radioprotective agents are used to reduce the damage caused by radiation in healthy tissues. There are several classes of radioprotective compounds that are under investigation. Analgesics and anti-inflammatory compounds are being considered for treating or preventing the effects of damage due to radiation exposure, or for increasing the chance of survival after exposure to a high dose of radiation. **In** this study, we investigated the radioprotective effects of some analgesic and anti-inflammatory compounds by evaluating buildup factors. The gamma ray **energy absorption (EABF)** and exposure buildup factors (EBF) were calculated for select compounds in a 0.015–15 MeV energy region up to a penetration depth of 40 mfp (mean free path). Variations of EABF and EBF with incident photon energy and penetration depth elements were also investigated. Significant variations in both EABF and EBF values were observed for several compounds at the moderate energy region. At energies below 0.15 MeV, EABF and EBF values increased with decreasing **equivalent atomic number** (Z_{eq}) of the samples. In addition, EABF and EBF were the largest for ibuprofen, aspirin, paracetamol, naproxen and ketoprofen at 0.05 and 0.06 MeV, respectively, and the EABF value was 0.1 MeV for aceclofenac. From these results, we concluded that the buildup of photons is less for aceclofenac compared to other materials.

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