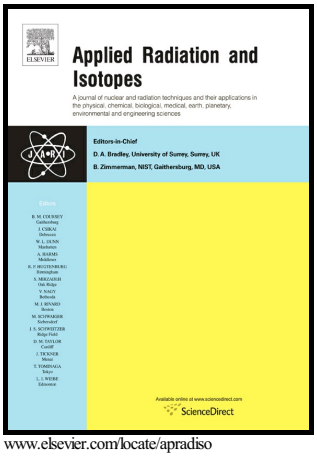

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Abstract

The effect of sodium as a co-dopant on the thermoluminescence (TL) properties of copper-doped zinc lithium borate (ZLB:Cu) subjected to Co-60 gamma radiation is reported in this study. TL intensity is enhanced with the introduction of sodium in ZLB:Cu. The obtained glow curve is simple with a single peak. The annealing procedure and the best heating rate for the proposed thermoluminescent dosimeter (TLD) are established, and the phosphor is reusable. The TL response within the dose range of 0.5–1000 Gy is investigated. The results show that the thermal fading behaviour is improved significantly.

Keywords: Co-dopant; Sodium Oxide; Thermoluminescence

1. Introduction

Radiation dose-measuring thermoluminescence (TL) detectors, which collect and store energy when exposed to ionizing radiation and release the energy as luminescence when heated, are simple, portable, reliable and easy to use. These detectors are widely used for