

TIAN-1: Simultaneous Measurement of Boron Concentration and Dose through Dual Prompt Gamma Detection

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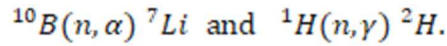
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A novel methodology of *in-vivo* measuring boron concentration and boron dose distribution during boron neutron capture therapy (BNCT) is proposed on the basis of the cross-sectional relationship of



Theoretical analysis of the accuracy of the proposed method with Monte Carlo simulation shows that the measurement error is generally less than 1% under different tumor locations and neutron source configurations. In the situation wherein the voxel size is larger than 0.4 cm, the measurement error can be increased for a non-uniformly distributed boron concentration in the voxel because of the changes of neutron energy and flux. In conclusion, the proposed method enables accurate boron measurement *in-vivo* during neutron irradiations in reasonable situations (e.g., BNCT).

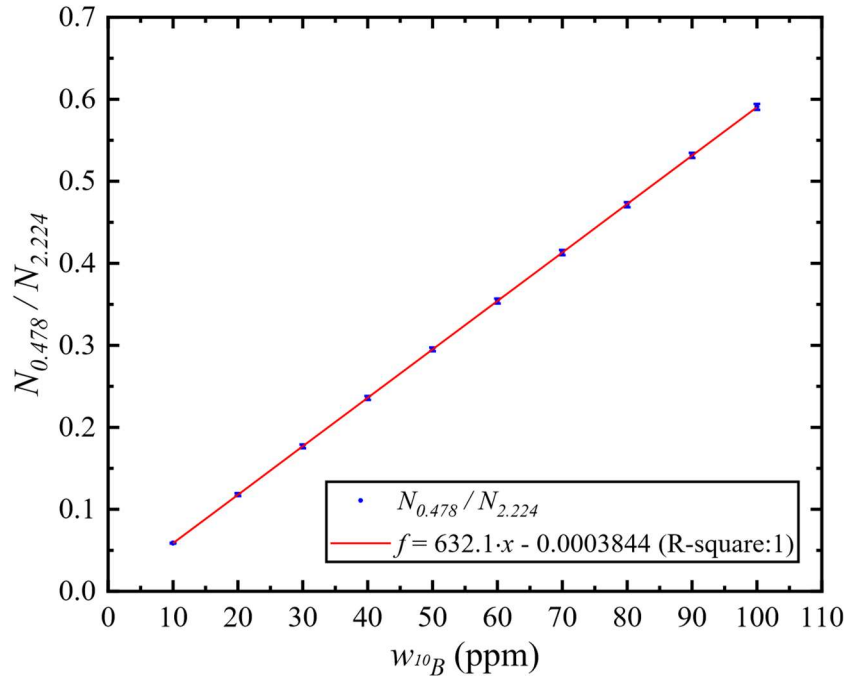


Figure 1. Relation between $N_{0.478}/N_{2.224}$ and ω_{10B}/ω_{1H} under uniform ^{10}B distribution