

技术及应用

新型PAGAT聚合物凝胶剂量计的磁共振成像研究

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摘要 使用丙烯酰胺、明胶、交联剂、除氧剂和甲醛等在常氧条件下制备出一种新型的PAGAT聚合物凝胶剂量计。实验结果表明:剂量计的磁共振横向弛豫率随吸收剂量的增加而增大, 经计算, 得出了剂量计的探测下限; 剂量计样品的批均匀性好于3.2%, 且剂量响应在0.05~1.00 Gy/s之间基本与剂量率无关。此外, 使用该剂量计对异质界面剂量分布的测量结果以及剂量增强效应进行了分析。

关键词 聚合物凝胶剂量计 PAGAT 磁共振成像 放射治疗 剂量验证

分类号

Magnetic Resonance Imaging Study of New PAGAT Polymer Gel Dosimeter

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Abstract A new type of PAGAT polymer gel dosimeter, containing acrylamide, gelatin, *N, N'*-methylene-bisacrylamide (BIS), tetrakis (hydroxymethyl) phosphonium chloride (THPC) and formaldehyde, was prepared under normal atmospheric conditions. The results show that its transverse relaxation ratio increases with the absorbed dose and its minimum detection limit is given. The dosimeter has good uniformity of one batch (better than 3.2%) and negligible dose-rate dependence in the range of 0.05-1.00 Gy/s. Using the gel dosimeter, the dose distribution of a heterogeneous interface was obtained and the dose enhancement effect was analyzed.

Key words polymer gel dosimeter PAGAT magnetic resonance imaging radiation therapy dose validation

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