

## Elemental analysis of materials of polymer gel dosimeters using PIXE

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### Abstract

Elemental analysis of materials of polymer gel dosimeters were performed using PIXE to evaluate concentration of medium-heavy elements in the materials because the medium-heavy elements have causative influences on radioactivation of the gel dosimeters when they are used in proton therapy. While K (130 $\mu$ g/g), Ca (60  $\mu$ g/g) and Fe (4  $\mu$ g/g) were detected in the sample, we did not detect a large amount of medium-heavy or heavy elements in the sample. In addition, although we measured gamma rays the gel samples which were irradiated at a dose of 2 Gy by an 80-MeV proton, no significant gamma rays due to the radioactivation were observed 24 hours after irradiation. Thus, polymer gel dosimeters can be used in proton therapy without serious radioactivation problems.