

## **Rate of elapsed polymerization of hydroxyethylacrylate gel induced by gamma irradiation**

### **ABSTRACT**

The rate of elapsed polymerization of polyhydroxyethylacrylate in gelatin has been studied to investigate the effect of co-monomers consumption at a given dose. The polymer gel dosimeters consisted of 2%-4% N,N-methylelene-bis-acrylamide cross-linker, 2%-4% 2-hydroxyethylacrylate monomer and gelatin at 3% and 5%. The dosimeters were irradiated by using <sup>60</sup>Co teletherapy  $\gamma$ -ray source up to 20 Gy at a constant dose rate. The relaxation rate of water proton in the dosimeters at different doses and co-monomer concentrations were measured using a nuclear magnetic resonance spectroscopy. The rate of elapsed polymerization decreases with increasing the dose and the initial concentration of co-monomers. The rate of consumption of co-monomers increases with an increase of the polymerization and the gelatin content of the polymer gel.

**Keyword:** Elapsed polymerization,Relaxation rate,Consumption rate, Polymer gel dosimeter