

STUDY ON THE EFFECT OF CHITOSAN IN POLY (VINYL PYRROLIDONE) HYDROGEL PREPARED BY THE APPLICATION OF GAMMA RADIATION

M. A. RASHID¹, M. T. ALAM², N. C. DAFADER³, M. E. HAQUE⁴, SHARIF M. AL-REZA⁵ & M. A. SATTAR⁶

^{1,2,5,6}Department of Applied Chemistry and Chemical Technology, Islamic University, Kushtia, Bangladesh

^{3,4}Nuclear and Radiation Chemistry Division, Institute of Nuclear Science & Technology, Atomic
Energy Commission, Dhaka, Bangladesh

ABSTRACT

Poly (vinyl pyrrolidone) (PVP) hydrogels with chitosan were prepared from their aqueous solution by the application of gamma radiation from Co-60 source at room temperature. The parameters like variation of total radiation dose and concentration of chitosan in PVP/chitosan mixture were studied. The properties of prepared hydrogel such as gel fraction, water absorption, swelling ratio and equilibrium water content were investigated. Gel fraction of hydrogel increases with increased radiation dose and reaches a maximum value at the radiation dose of 25 kGy, beyond which the gel fraction remains almost unchanged with further increased radiation dose. Water absorption of hydrogel reaches a maximum value at 27 hours standing time in water. It is also found that water absorption, swelling ratio and equilibrium water content decreases with increased radiation dose and concentration of chitosan in the feed solution.

KEYWORDS: Poly(Vinyl Pyrrolidone), Chitosan, Hydrogel, Gel Fraction, Water Absorption, Radiation