CHEMICAL AND PHYSICAL PROPERTIES OF VINY1 AND AMIDE HYDSROGELS PREPARED BY IONIZING RADIATION

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The present work is undertaken to prepare hyDROPhilic hydrogels by gamma irradiation based on different ratios of N-viny1-2- pyrrolidone and acrylamide (AAm) comonomers. Research work covers the following points: (A)Gamma Radiation Synthesis of hydrogels and Characterization (B)Chemical properties of the prepared hydrogel (C)Physical properties of the prepared hydrogelThe hydrogels were characterized by thermogravimetric analysis (TGA), IR spectroscopic analysis (IR), scanning electronmicroscopy (SEM). The effects of both temperature and pH on the degree of swelling of the acrylamide (AAm) and N-vinyl-2-Pyrrolidone (VP) comonomer based hydrogels were also studied. The results obtained through this work can be summarized through the following points: (A)Gamma Radiation Synthesis of hydrogels and CharacterizationIn this part, hydrogels based on different ratios of acrylamide (AAm) and N-vinyl-2-Pyrrolidone (VP) comonomers are prepared by gamma radiation copolymerization. (B)Chemical properties of the prepared hydrogelThe chemical structure, thermal stability and structure morphology of hydrogels were characterized by FT-IR spectroscopy, thermogravimetric analysis (TGA) and pcanning electron’MI Prnor.”1-• en, /Q E” AA 4- . — TT1•showed the formation of copolymerization and the presence of hydrogen bonding. (C) Physical properties of the prepared hydrogelWhile the TGA study shows that AAm/VP based hydrogels possess higher thermal stability than PAAm. However, the thermal stability of AAm/VP hydrogels increases with increasing the ratio of VP component. The swelling kinetics in water study showed all the hydrogels reach the equilibrium state after 24 hours. However, AAm/VP based hydrogels show swelling in water lower than the hydrogel based on pure AAm. Meanwhile, the degree of swelling of AAm/VP based hydrogels was found to decrease with increasing the ratio of VP in the feeding solutio..The results showed that the PAAm and AAm/VP based hydrogels prepared at 50 kGy were affected by the change in temperature around 25°C, whereas the hydrogels prepared at 25 kGy, do not show this character. However, the hydrogels prepared at different doses displayed reversible pH character