عنوان مقاله:

Swelling/release behaviour of semi-interpenetrating network hydrogels composed of PVA and poly (acrylamide-co-(acrylic acid

محل انتشار:

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نویسندگان:

Atefeh Hekmat - *Chemical Engineering Department, Faculty of Engineering, Arak University,Iran*

Abolfazl Barati - *Chemical Engineering Department, Faculty of Engineering, Arak University,Iran*

Ebrahim Vasheghani-Farahani - *Biotechnology Group, Chemical Engineering Department, Tarbiat Modares University, Tehran, Iran*

Ali Afraz - *National Iranian Oil Company, Tehran, Iran*

خلاصه مقاله:

In modern agriculture, polymeric hydrogels are known as active material that able to hold a huge amount of water due to their 3-dimensional network structure and their tendency to absorb water in humid environments. In addition, these hydrogels are able to control the release of fertilizers and pesticide loaded in them. Therefore, they deliver these materials to the plants' roots and help them with growing. These hydrogels also reduce the pollution of underground water sources by preventing the active components from leaching. In this work, semi-interpenetrating polymeric hydrogels were prepared by polymerizing aqueous solution f acrylamide and potassium acrylate, using ammonium persulfate and sodium metabisulfite initiating system and N,N'-methylene bisacrylamide as a crosslinker in the presence of a host polymer, poly (vinyl alcohol). The effects of network compositions such as cross-linker density, ionizable monomer, and total monomer concentration together with the linear polymer (PVA) concentration on the free swelling behavior of sIPN hydrogels in distilled water and electrolyte solution containing mono and bivalent counterions were studied. It was found that hydrogels prepared at low cross-linker and total monomer concentrations and high ionizablemonomer concentration medium exhibit high equilibrium swelling and solvent sorption rate at free swelling conditions. Moderate amount of linear polymer in the network accompanied its mechanical stability and release rate and strengthen it too.

کلمات کلیدی:

hydrogel, controlled release, ammonium nitrate, fertilizer, sIPN