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Waste management and green synthetic approach of copolymeric hydrogel in water purification

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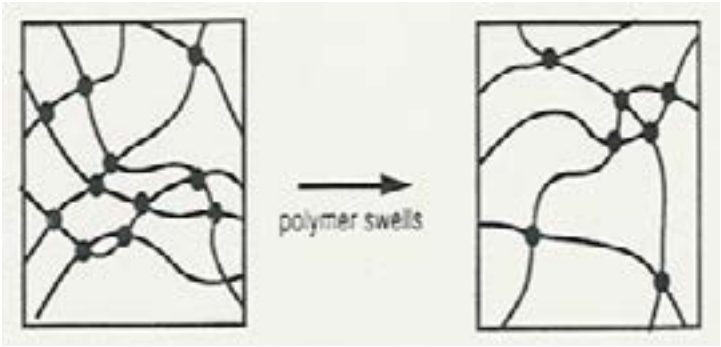
Water is the most precious natural resource that exists on our planet. Water pollution affects human health and life. The resources of water on earth are limited and are reducing every year. It is a well-known fact that clean water is absolutely essential for healthy living. In modern countries, untreated sewage, poorly treated sewage, or overflow from under-capacity sewage treatment facilities can send disease-bearing water into rivers and oceans. Many textile industries use dyes to colour their products. These dyes tend to be disposed in industrial waste water and possess several life threatening problems. Malachite Green is a toxic chemical which can lead to many diseases including carcinogenicity. The chemical was classified a Class II Health Hazard because it is found to be toxic to human cells and might cause liver tumor formation. To avoid the dangerous accumulation of dyes in the aquatic system, removal of waste materials is necessary. Amongst the numerous techniques of dye removal, adsorption is a useful tool for protecting the environment.. TTEGDA-crosslinked N-vinyl pyrrolidone-acrylic acid is the adsorbent used. Varying conditions like effect of temperature, nature and degree of crosslinking, amounts of polymer and concentration of dye solution have been studied. Weight of dye bound increases when the concentration of the dye increases. Weight of dye bound also varies with varying crosslink density. Characterization of the dye and dye bound polymeric hydrogel was carried out by IR, UV and SEM. From the results, it was clearly found that TTEGDA-crosslinked NVP-AA is an efficient adsorbent for the removal of Malachite Green from water.



Scheme: Swelling of TTEGDA-crosslinked N-vinyl pyrrolidone-acrylic acid

Biography

Gigimol M G is a Research Guide (Chemistry) of M.G University. Now working as Assistant professor in Chemistry at Alphonsa College Pala, Kerala, India. Dhanya K.R is a Post doctoral Fellow at M.G University, Kottayam, Kerala.

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