

Sintesis dan Karakterisasi Hidrogel Poli(N-vinil pirrolidon) (PNVP) Terikat Silang Melalui Polimerisasi Radikal Bebas = Synthesis and Characterization of Crosslinked Hydrogel Poly(N-vinyl pyrrolidone) (PNVP) by Free Radical Polymerization

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Abstrak

ABSTRAK

Hidrogel poli(N-vinil pirrolidon) terikat silang telah disintesis dengan menggunakan agen pengikat silang etilen glikoldimetakrilat (EGDMA) dan NN'-metilenbisakrilamid (MBAm), inisiator benzoil peroksida dan pelarut etanol melalui teknik polimerisasi radikal bebas. Dilakukan variasi jenis dan konsentrasi agen pengikat silang serta waktu reaksi. Hidrogel yang terbentuk dikarakterisasi menggunakan FT-IR dan analisa gravimetri. Ditemukan bahwa hidrogel PNVP terikat silang dengan baik jika digunakan MBAm 5% sebagai agen pengikat silang daripada EGDMA dengan waktu reaksi 24 jam. Hidrogel PNVP-MBAm ini memiliki derajat ikat silang yang lebih tinggi daripada PNVP-EGDMA yaitu 28,8% dengan kemampuan menyerap air sekitar 250%. Derajat ikat silang berbanding terbalik dengan kemampuan hidrogel menyerap air atau mengembang (swelling). Semakin lama waktu reaksi, semakin banyak ikatan silang yang terbentuk. Semakin tinggi derajat ikat silang maka semakin rendah kemampuan hidrogel dalam menyerap air.

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ABSTRACT

This article describes about the synthesis of chemically crosslinked hydrogels poly(N-vinyl pyrrolidone) (PNVP) by free radical polymerization in solution technique. Ethylene glycoldimethacrylate and NN'-methylenebisacrylamide were used as crosslinker, benzoyl peroxide was used as initiator and ethanol was used as a solvent. Hydrogels were prepared by varying the type and concentration of crosslinker, and also reaction time. Resulted hydrogels were characterized by FT-IR and gravimetry analysis. Crosslinked hydrogels PNVP by using crosslinker MBAm 5% with 24 hours reaction time had the highest degree of crosslinking about 28,8% and 250% for its swelling ratio. The degree of crosslinking inversely proportional with hydrogels ability to absorp water (swelling). The longer reaction time was, the higher degree of crosslink was. The higher degree of crosslink was, the lower swelling ability of the hydrogels was.