

RADIATION-INDUCED SIMULTANEOUS GRAFTING OF 2-HYDROXYETHYL-METHACRYLATE (HEMA) ONTO NATURAL RUBBER (NR) TUBES

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ABSTRACT

RADIATION-INDUCED SIMULTANEOUS GRAFTING OF 2-HYDROXYETHYL-METHACRYLATE (HEMA) ONTO NATURAL RUBBER (NR) TUBES. An attempt has been made to obtain a graft copolymer of natural rubber (NR) with 2-hydroxyethyl-methacrylate (HEMA). The graft copolymer (NR-g-PHEMA) was synthesized with radiation-induced simultaneous grafting of HEMA monomer onto NR tubes. Following the selection of an appropriate solvent for the grafting, effects of monomer concentration, temperature, irradiation dose, and dose rate were studied. It was found that the grafting proceeds effectively in the presence of carbon tetrachloride (CCl_4) as a solvent. At a given monomer concentration of 20 Vol%, the degree of grafting increases with the increasing of temperature, irradiation dose and dose rate. The rate of grafting was found to be proportional to 0.68 power of dose rate. An apparent activation energy was calculated to be 4.50 kcal/mol and the grafting efficiency of 4.90 % was achieved. The result of blood compatibility test on the graft copolymer showed that it was slightly improved.

ABSTRAK

RADIASI GRAFTING SIMULTAN 2-HIDROKSIEETILMETAKRILAT (HEMA) PADA KARET ALAM (NR). Telah dicoba untuk mendapatkan graft kopolimer karet alam (NR) dengan 2-hidroksi-etilmetakrilat (HEMA) melalui cara radiasi grafting simultan. Setelah dilakukan pemilihan pelarut, maka ditentukan pengaruh konsentrasi monomer, suhu, dosis dan laju dosis iradiasi terhadap kemampuan serta efisiensi grafting.

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