# Sintesis dan karakterisasi Polistirena-blok-poli (etil akrilat) dengan metode atom transfer radical polimerisasi = Synthesis and characterization polystyrene-block-poly (ethyl acrylate) with atom transfer radical polymerization

Meyda Nurluthfiany, author



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Abstrak

Dalam penelitian ini dilakukan sintesis polistirena-blok-poli(etil akrilat) dengan metode atom transfer radical polymerization (ATRP) untuk mempelajari pengaruh variasi konsentrasi inisiator terhadap berat molekul dan indeks polidispersitas (PDI) makroinisiator, serta mempelajari pengaruh variasi konsentrasi monomer terhadap sifat termal kopolimer blok. Dari hasil penelitian diperoleh semakin tinggi konsentrasi inisiator, berat molekul dan nilai indeks polidipersitas yang didapat semakin kecil. Komposisi optimum untuk sintesis makroinisiator polistirena didapat saat konsentrasi inisiator 1,6%, dengan rata-rata berat molekul sebesar 3613 g/mol dan diperoleh nilai indeks polidispersitas sebesar 1,07. Terbentuknya polistirena-blok-poli(etil akrilat) ditunjukkan oleh hasil karakterisasi dengan nuclear magnetic resonance (1H-NMR). Munculnya puncak kuartet pada 4,2 ppm menunjukkan serapan dari metil ester poli(etil akrilat). Hasil karakterisasi dengan gel permeation chromatography (GPC) juga menunjukkan bertambahnya berat molekul menjadi 4098 g/mol. Dengan demikian polistirena-blok-poli(etil akrilat) telah berhasil disintesis. <hr>Within this research, polystyrene-block-poly(ethyl acrylate) synthesis is done by using the atom transfer radical polymerization (ATRP) method to study the effects of various initiator concentration towards the molecular weight and polydispersity index (PDI) macroinisiator, also to study the effects of various monomer concentration towards the thermal properties of block copolymers. The conclusion resulted from this research is that the higher the concentration initiator, the smaller the molecular weight and PDI number obtained. The optimum composition to synthesize polystyrene macroinisiator is obtained when the initiator concentration is 1,6% with the average molecular weight of 3613 g/mol and the polydispersity index number 1,07. The formation of polystyrene-block-poly(ethyl acrylate) is shown by the result of characterization with nuclear magnetic resonance (1H-NMR). The emergence of maximum quartet at 4,2 ppm indicates the uptake from methyl esters of poly(ethyl acrylate). The result of characterization with permeation chromatography (GPC) also shows the increase of molecular weight, becoming 4098 g/mol. Therefore, polystyrene-block-poly(ethyl acrylate) has successfully been synthesized.