Synthesis and polymerization of some activated monomers

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In the present work, acrylic and methacrylic esters of N-hydroxyphthalimide were synthesized and polymerized, The synthesis of N -acryloyloxy - and N -methacryloyloxyphthalimides were accomplished in fair yield by the reaction of acryloyl and methacryloyl chlo- rides with N-hydroxyphthalimide in the presence of triethylamine. Also, N-acryloyloxy- and N-methacryloylo- xyphthalimide monomers -were prepared from the reaction of acrylic and methacrylic acids with N hydroxyphthali- mide in the presence of N,N-dicyclohexylcarbodiimide, the prepared monomers were polymerized by solution poly- merization and the polymers were collected by filtration washed and dried. The ability of the prepared activated -polymers to enter an exchangereactions with amines (ethylamine, piperidine and p anisidine) and alcohols (phenol and cyclohexanol) and the percent exchange react ions were almost quantitative as indicated byelemental and spectrophotometric analyses. Similarly, methacrylic ester of N-hydroxytetrabro- ophthalimide was -synthesized and polymerized. The synthesis of N methacryloyloxytetrabromophthalimide was carried out by the reaction ofmethacryloyl chloride with N-hydroxytetrabromophthalimide in presence of tri- -ethylamine, and also, from the reaction of methacrylic acid with N hydroytetrabromophthalimide in presence of N,N-dicyclohexylcarbodiimide as dehydrating agent. The exchange ability of the prepared poly-N-methacrylo- yloxytetrabromophthalimide with amines and amino acids was calculated frombromine analysis and the percent exchange was found to be: 85.75, 88.24, 92.52, 72.11 and 75.11 % for aniline, p-toluidine, p-anisidine,o-aminobenzoic acid -and p-aminobenzoic acid, respecti- vely. The percent exchange reaction of poly-N methac- ryloyloxytetrabromophthalimide with hydroxylated comp- ounds was also studied and calculated from bromine analysis and was found to be: 84.09, 84.19, -61.61 and 67.08 % for phenol, cyclohexanol, o-hydroxybenzoic acidand p hydroxybenzoic acid, respectively. Also, a direct comparison between the exchange -reactions of poly-N-methacryloyloxyphthalimide andpoly-N methacryloyloxytetrabromophthalimide with p-ani- sidine (as an example of amines) and cyclohexanol (asan example of hydroxylated compounds) was carried out at various times (15-120 min.) at 60 °C, and the percentexchange reaction in each case was calculated from1 H NMR spectroscopy and elemental analysis. The results indicate that the percent exchange reactions of p-anis- idine with both polymers was almost the same at various times of reaction, while in caseof

cyclohexanol the percent exchange reactions with poly-N-methacryloyloxy--tetrabromophthalimide were much higher than those with poly-N methacryloyloxyphthalimide.of N,N-dicyclohexylcarbodiimide as dehydrating agent. The exchange ability of the prepared poly-N-methacrylo-yloxytetrabromophthalimide with amines and amino acids was calculated frombromine analysis and the percent exchange was found to be: 85.75, 88.24, 92.52, 72.11 and 75.11 % for aniline, p-toluidine, p-anisidine, o-aminobenzoic acid -and p-aminobenzoic acid, respecti- vely. The percent exchange reaction ofpoly-N methac- ryloyloxytetrabromophthalimide with hydroxylated comp- ounds was also studied and calculated from bromine analysis and was found to be: 84.09, 84.19, -61.61 and 67.08 % for phenol, cyclohexanol, o-hydroxybenzoic acidand p hydroxybenzoic acid, respectively.Also, a direct comparison between the exchange reactions of poly-N-methacryloyloxyphthalimide andoly-N-methacry loyloxytetrabromophthalimide with p-ani- sidine (as an example of amines) andcyclohexanol (asan example of hydroxylated compounds) was carried out at various times (15-120 min.) at 60 °C, and the percent exchange reaction in each case was calculated from1 H NMR spectroscopy and elemental analysis. The resultsndicate that the percent exchange reactions of p-anis- dine with both polymers was almost the sameat various times of reaction, while in case of cyclohexanol the ercent exchange reactions with poly-N-methacryloyloxy--tetrabromophthalimide were much higher than those witholy-N methacryloyloxyphthalimide.