FRIEDEL-CRAFTS ACYLATION ON POROUS DIVINYL BENZENE POLYMER PARTICLES - A REACTION KINETIC STUDY USING INFRARED SPECTROSCOPY

ALFRED A. CHRISTY, *Agder College, Department of Chemistry, N-4604 Kristiansand, Norway*; BJØRN GRUNG, O. M. KVALHEIM, *Department of Chemistry, University of Bergen, N- 5007 Bergen, Norway*; ANNE K. NYHUS, *Department of Industrial Chemistry, Norwegian University of Science and Technology, N-7034 Trondheim, Norway*; STEINAR HAGEN and JON S. SCHANCHE, *Amersham Pharmacia Biotech AS, P.O.Box 213, N-2001 Lillestrøm, Norway*.

Porous poly(para-divinylbenzene) and poly(meta-divinylbenzene) particles were synthesised from para-divinylbenzene and meta-divinylbenzene monomers with toluene and 2-ethylhexanoic acid as porogens. The residual vinyl groups in the particles were thereafter reacted with lauroyl chloride using the Friedel-Crafts reaction. The conversion of vinyl groups was followed by analysing polymer particles taken from the reaction mixture at different time intervals. Infrared spectroscopy both in the mid and near infrared region was used as the analytical technique. The intensity changes in the overtone absorption at 1628 nm due to the vinyl bonds was used as the basis for the quantification of the reaction. Spectra of the particles in the mid IR region provide understanding of the changes taking place in the polymer matrix during the acylation reaction.

The results indicated that the reaction took place at a faster rate in the polymer particles synthesised from para-DVB monomer compared with the poly(meta-DVB) particles. The polymer particles synthesised with toluene as porogen react faster than the polymer particles prepared with 2-ethylhexanoic acid as the porogen. The analysis also indicated that the acylation takes place at the early stages of the reaction and the product formed transforms into more stable products at the latter stages. Based on the infrared analysis, mechanisms for the formation of the different products are proposed.