

MONITORING OF REACTION KINETICS DURING THE SYNTHESIS OF STATIONARY PHASE POLYMER PARTICLES BY INFRARED SPECTROSCOPY

ALFRED A. CHRISTY, *Department of Chemistry, Agder College, Tordenskjoldsgt-65, N-4604 Kristiansand, Norway.*

The residual vinyl groups in Porous poly(para-divinylbenzene) and poly(meta-divinylbenzene) particles were subjected to chemical reactions to modify their surface properties, so that they could be used as stationary phase in separation science. The particles were reacted with aluminium chloride in dichlorobenzene. The aim of the reaction was to induce inter cross-linking and intra cyclization of polymer chains in the particles. The conversion of vinyl groups was followed by analysing polymer particles taken from the reaction mixture at different time intervals. The overtone due to the vinyl C=C stretching was found to be useful in monitoring the consumption of the double bonds in the reaction. This was also used to quantify the remaining vinyl groups in the particles. The infrared spectra of the particles in the mid-IR region were measured to understand the chemistry of the reaction taking place in the system.

The results indicated the residual vinyl groups in these polymer particles were consumed during the reaction with aluminium chloride. It appears that the reaction leads to addition of HCl, cross-linking and cyclization in the polymer particles. The particles also react with aluminium chloride at different rates showing dependency on the pore size within the particles.