

## **POLYMERIZATION PROCESSES OF POLAR MONOMERS AND IN WATER USING SINGLE-SITE CATALYSTS**

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It will be described how we perform polymerization processes with single-site catalysts. We apply no-air systems and Schlenck-tube lines to protect the active polymerization catalysts and all the ingredients of the reaction. As an example of our purifying systems, we have a continuous solvent still, in which we dry our typical organic solvent toluene with sodium and benzophenone. Any liquid monomer is dried according to their chemical nature, for example acrylates with molecular sieve or calcium hydride. The polymer is typically synthesized in a glass autoclave with a heating jacket and optional outlet. If suitable our polymerizations are initiated by the introduction of a catalyst solution through an injection port. We utilize a mass flow meter to monitor the main monomer ethylene. Using the Labview program we obtain mass flow and reaction temperature diagrams. Most of our polymerizations are run as precipitations (or the “slurry” mode). More recently, we have been working on solution polymerizations run at higher temperatures using ethylene polymers of lower molecular weight. A new setup of an ultrasonic emulsifier now allows us to run emulsion polymerizations. In these experiments we are able to polymerize various monomers in the presence of water as solvent. One of our tasks will be to adjust conditions for emulsion to obtain polyethylene particles in the 50 – 200 nm range scale.