

Standard Operating Procedure

General Laboratory Safety

Facility:	Polymer Reaction Engineering Laboratory Department of Chemical Engineering
Lab Director:	Kyu Yong Choi /Student: Yun Ju Jung
Scope:	This SOP details the Personal Protective Equipment (PPE) requirements for work in the Polymer Reaction Engineering Laboratory
Last Revision:	09/04/09

Experiment:

Micro Dispersive Suspension Polymerization of MMA.

Procedures:

1. Prepare PVA solution (Poly(vinyl alcohol) (87-89% hydrolyzed, MW = 85000-124000 from Aldrich) as a stabilizer)
 - a. Measure the 3 g of PVA in a 250ml-flask
 - b. Pour the 200ml of deionized water in the flask
 - c. Put the magnetic stirrer in the flask
 - d. Cap the flask
 - e. Put the flask on the stirrer and dissolve the PVA
 - f. Cool the PVA solution
2. Make the oil mixture
 - a. Measure the 0.987g of LPO in a 125ml-flask
 - b. Measure the 0.466g of PDMS(50~90cst, MW=4000~6000) in a 20ml-vial
 - c. Put 35ml of purified MMA in the 125ml-flask
 - d. Put 15ml of hexane in the 20ml-vial
 - e. Dissolve the LPO and PDMS
 - f. Pour the PDMS-hexane solution into the LPO-MMA solution and stir it
3. Make the ice bath
4. Put the reactor in the ice bath
5. Pour the water mixture and the oil mixture in the reactor
6. Agitate the liquid at 500 rpm and purge by Nitrogen for 30 min in the ice bath

7. Heat the water bath to 70°C and prepare to take samples(measure the weight of plates, and so on)
8. After 30min remove the ice bath and connect the water bath
9. Turn on the condenser
10. Consider that connection time to water bath is 0min
11. Take each sample
 - a. At each sampling time turn off the agitator, take a sample, and then turn on the agitator again
 - b. Put the liquid sample on the plate and measure the weight of plate+liquid
 - c. Remove the solvent and unreacted MMA from the liquid sample
 - d. Measure the weight of plate+solid
12. After finishing the polymerization, turn off the agitator, nitrogen gas, and condenser
13. Open the reactor and pour the methanol into the suspension
14. Stir the suspension until all the PMMA is precipitated
15. Filter it
 - a. Use the 542 filter paper(from Whatman)
 - b. Attach the filter paper on the filter using methanol
 - c. Pour the suspension to the filter
 - d. After filtering, gather the filtered waste in a waste container.
16. Get the wet polymer samples
17. Dry them in the vacuum overnight
18. Weigh them and calculate the conversions