

CHAPTER I

INTRODUCTION

The Purpose of the Investigation

Nowdays the navigation is worldwide, consequently, the water pollution occurs. Because the oil spill layer on the water surface reduces the amount of dissolved oxygen which is vital for all living organisms beneath, and damages the surrounding environment.

The industrial development is expanding tremendously and rapidly to acquire the convenience of the mankind. The industries also produce various kinds of pollution problems, the main cause of which stems from the residue solvent in the drainage from the productions, for example, toluene, one of the most useful solvents in many resin industries, coating industries and other chemical industries. This solvent can be accumulated in the body and afterwards damage lung, liver and kidney (1), etc.

One approach to solve parts of the above problems, the sorptive material must be produced to get rid of some or all of these solvents and oil. Consequently, the main purpose of this research is to search for the procedure of the sorbent preparation and test the sorptive properties of the material. This material, while sorbing the solvents or oil, will swell and perhaps float on the water surface, depending on the density of sorbent. Therefore the swollen beads can be separated from the water conveniently for the recovery of the solvents and oil.

Objectives

1. To synthesize the styrene-divinylbenzene copolymer bead by suspension polymerization. Effects of such influential parameters as diluents, inhibitor, and nitrogen flow rate were studied
2. To characterize the properties of the styrene-divinylbenzene copolymer bead, such as bead size and size distribution, pore size, pore volume, and specific surface area of pore.
3. To study the solvent sorption and desorption properties of the styrene-divinylbenzene copolymer bead.

Scopes of the Investigation

Since the specification of the suspending agents was not as same as the previous study (2-4), the appropriate polymerization condition was studied again. The necessary process to achieve the goal may be as follows.

1. Literature survey and in-depth study of this research work.
2. Synthesizing the polystyrene crosslinked with divinylbenzene beads by means of suspension polymerization by changing the following parameters so as to attain the appropriate reaction condition:
 - (a) The optimum quantity of the suspending agents and NaHCO_3 ;
 - (b) The times and temperatures of the polymerization process;
 - (c) The effect of quantity of the inhibitor;
 - (d) The effect of nitrogen flow rate and diluent.
3. Bringing the synthetic beads to the further seeding step:
 - (a) Classifying the synthetic beads into groups based on sizes;
 - (b) Bringing each group of beads into the solution mixture of the monomer and the initiator;

(c) Bringing the swollen beads from (b) to further polymerization in the suspending medium;

4. Studying the sorption and desorption of the synthetic beads in the toluene.

5. Studying the properties of pore, e.g., pore size, pore volume and specific surface area.

6. Summarizing the results and writing up the thesis.