



CHAPTER 1

INTRODUCTION

In the present time, we encounter the population explosion crisis. Raw materials from natural resource are rapidly decreasing. Human being tries to create new synthetic substances and materials and use them in lieu of using natural resource. Synthetic rubber and plastic are good examples of synthetic substances that we create to use in the place of ores and natural woods. Styrene monomer is of such synthetic substance that we place for producing plastics and synthetic rubber. The various kinds of products from styrene monomer are, for example, polystyrene, rubber - modified impact polystyrene, acrylonitrile - butadiene - styrene terpolymer, styrene acrylonitrile copolymer, styrene rubber and styrene - butadiene rubber, etc. Furthermore, we can utilize styrene polymer in the fields of packaging and producing toys and home appliances. Expanded foam of polystyrene has excellent heat insulation and floating properties which can be used in construction and refrigeration as well as numerous use in packaging. A number of copolymer products have been formulated to provide higher shock resistance. In addition, polystyrene is used for shoe heels, electronic, furniture, etc. The product of styrene monomer now ranks third in the volume produced in the plastics field behind polyethylene and polyvinyl chloride.

Styrene is a liquid which can be handled easily and safely. The activation of the vinyl group by the benzene ring makes styrene easy to polymerize and copolymerize under a variety of conditions. Polystyrene is one of the least expensive thermoplastics on a cost - per - in³ basis. Production of styrene plastic has shown remarkable growth and they now account for the majority of the monomer (11,14).

Today, in Thailand, styrene monomer is used widely in the plastic industry. Recently the Pacific Plastic (Thailand) Ltd., a subsidiary of Dow Chemical of the U.S.A., had built the polystyrene plant with a capacity of 15,000 metric tons of polystyrene per year, in Samut Prakarn Province. Thus, we can see that styrene monomer is very useful.

1.1 The objective of this work

1. To determine the rate of the reaction
2. To study the effect of partial pressure on the rate of reaction
3. To study the effect of temperature on the rate of reaction
4. To study the effect of diluent on the rate of reaction

1.2 The Scope of this work

1. Constructed the apparatus for styrene synthesis.
2. Vary the partial pressure of the reactant at fixed reaction temperature
3. Vary the temperature of the reaction at fixed partial pressure of the reactant

4. Vary the diluent at fix reaction temperature and partial pressure of the reactant.



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย