

## CHAPTER IV

### CONCLUSIONS

The works done in this research were the preparation of unsaturated polyesters and unsaturated polyester resins, characterization of unsaturated polyester resins and thermoset polyester. It was found that methyl methacrylate affects the above mentioned study. The following conclusions could be drawn from the present study.

1. Methyl methacrylate has an influence on the typical properties of polyester resins namely viscosity, gel time, cure time and exothermic peak temperature.

1.1 Modification of the unsaturated polyester resins by increasing the amount of MMA in the resin results in a reduction of the viscosity and exothermic peak temperature. The ratio of UP : SM : MMA = 65 : 0 : 35 gave the lowest viscosity and exothermic peak temperature.

1.2 Increasing the amount of MMA in the resins increases the gel time and cure time. The ratio of UP : SM : MMA = 65 : 0 : 35 gave the longest gel time and cure time.

2. Modification of the thermoset polyester by increasing the amount of MMA indicated that the mechanical properties deteriorated as follows:

2.1 Variation in the ratio of UP : SM : MMA has small effect on the tensile strength, flexural strength and hardness of thermoset polyester.

2.2 Decrease in heat distortion temperature of thermoset polyester was observed as the amount of MMA was increased.

3. Variation of the MEKPO in the range of 0.5-2.0 v/wt% of MEKPO in unsaturated polyester resin has small effect on the mechanical properties.

4. The glass fiber reinforced plastic of unsaturated polyester resins shows higher tensile strength, flexural strength and heat distortion temperature.

5. The effect of methyl methacrylate on properties of the orthophthalic unsaturated polyester resin and thermoset polyester show the same trend as in the case of the isophthalic unsaturated polyester resin, and thermoset polyester.

6. In spite of a degradation of mechanical properties resulted from increasing the amount of MMA in the unsaturated polyesters, the weathering resistance of thermoset polyesters was improved. Therefore, the ratio of unsaturated polyester resins suitable for applications are ortho UP : SM : MMA = 65 : 30 : 5 and iso UP : SM : MMA = 65 : 10 : 25.