

## CHAPTER V

### CONCLUSION

The flame-retardant properties of zinc stannate, zinc hydroxystannate and antimony trioxide in polypropylene were investigated. It was concluded that zinc stannate and zinc hydroxystannate were effective flame retardant and smoke suppressant when used in synergism with decabromodiphenyl oxide. The LOI value obtained for this system, 7.5% ZHS / 30% DBDPO, was greater than that was given by ZHS alone. The effectiveness of tin compounds as flame retardants in polypropylene depended on the incorporation level of decabromodiphenyl oxide. In this study, it was found that zinc hydroxystannate showed the similar flame retardancy as antimony trioxide but zinc stannate showed less flame retardancy than antimony trioxide in brominated polypropylene. Furthermore, zinc stannate and zinc hydroxystannate had small effect on mechanical properties of brominated polypropylene.

Thermoanalytical and related mechanistic studies indicated that the flame-retardant action of zinc stannate and zinc hydroxystannate in brominated polypropylene involved both condensed and vapor phase reactions.

Ultimately, inorganic tin compound, in particular, zinc stannate and zinc hydroxystannate, are effective flame retardant in polypropylene system. They appeared to have advantages over certain existing commercial additives such as;

Non-toxicity.

Effective at low levels.

Little apparent effect on mechanical properties.

No discoloration of substrate.

Smoke-suppression.

Flame-retardant synergism with halogen compounds.

Wide range of applicability.