



CHAPTER I

INTRODUCTION

Each year many human lives and materials of large values are destroyed by fire. In Germany in 1980, 500 people died and damages of DM 2500 million were caused by fires. In most cases, polymers initiate or propagate fires. They decompose to volatile combustible products when they are exposed to heat. To render this disaster, paint could assist delaying the combustion time. This meant that vital escape time should be prolonged; hence revealing the difference between survival and death.

The use of flames retardant reduces the flame spread and so the rate of smoke develops. Less smoke production gives and increases in the escape time available. Flame retardants have been widely use for plastics, rubber or other polymers, contribute directly to saving of lives, reducing injury and economic loss.

Flame retardant paints can be achieved by several techniques, for example the use of binder which produces nonflammable gas (chlorinated rubber, polyvinyl chloride, *etc.*), use the impregnated substances which are applied to surfaces to penetrate the substrate in order to retard the spread of fire or use the flame retardant special filler.

This research intends to use ammonium polyphosphate (APP) as flame retardant filler which forms the glasslike melts from phosphates by the development of the porous, spongy layer acts as an insulation layer preventing further decomposition of the material, together with metal hydroxides (aluminium trihydroxide, ATH) which decompose endothermally and release water.

Owing to paint being very close to human life, the microorganisms, particularly fungi spread on the surface of paint may be harmful to human's health. Normally a fungicide is added into the paint to prevent it from bacteria and fungus both of wet state and paint film. This research also tries to use new fungicides as alternatives to replace the existing fungicide, zinc omadine complex.

Research goal

The goal of this research could be summarized as follows:

1. To improve the flame retardant performance of 100% acrylic emulsion paint by APP, ATH and their combinations.
2. To evaluate antifungal activity of new paint formula containing new fungicides comparing with the existing formula.