ABSTRACT

The unsaturated Polyester Resin has been widely used as a matrix resin for FRP (Fibre Reinforced Plastics) composite.

The FRP composite materials are finding extensive applications, almost in all walks of life; with the aerospace, defence, automotive, chemical, marine, etc.

The polyester resins are cured for the above application both at room temperature as well as elevated temperature, by employing a suitable catalyst. In the case of room temperature curing, Methyl Ethyl Ketone Peroxide (MEKP) is used as catalyst and its decomposition is accelerated by Cobalt Salt such as Cobalt Octoate. In most of the room temperature curing applications such as for making FRP components and cultured marble/onyx products, the geltme is adjusted by changing the concentration of MEKP and Cobalt Octoate and more so by changing the concentration of MEKP catalyst.

It has been reported, in the literature, on the influence of MEKP catalyst concentration only on geltme. Peak exotherm temperature and time taken to reach Peak exotherm temperature. In most of the cases, the effect of MEKP catalyst has been studied up to 2% by weight of resin. Hence the influence of MEKP concentration on gelation rate, Shrinkage property, thermal, mechanical chemical and fire retardant property of both neat and filled orthophthalate unsaturated polyester resin has been systematically studied. A plausible mechanism has been proposed to explain the variation of above properties with change in concentration of MEKP.

The concept of variation in cross-linking density with variation in MEKP concentration has been explained and the variation in crosslinking density has been demonstrated by scanning Electron microscopic studies.

In order to confirm the correlation between cross-linking density and MEKP concentration, the influence of MEKP concentration has been studied on Isophthalate Polyester Resin. Based on the above studies, the optimum addition level of MEKP for ortho and Isophthalate resin has been recommended.