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## THERMAL PROPERTIES OF NEW INTERPENETRATING POLYMER NETWORKS BASED ON EPOXY-ACRYLATE

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**ABSTRACT** - Various combinations of epoxy and acrylate ester were prepared as Simultaneous Interpenetrating Polymer Networks (IPNs). Thermal characteristics of the new materials were measured by DSC and TGA thermal analysis. Thermal stability characteristics such as  $T_g$  , decomposition temperature, rate of decomposition, activation energy of decomposition .. etc. were investigated and found to increase with increasing the acrylate content in the IPNs. The IPNs showed encouraging characteristics as compositing materials.

### INTRODUCTION

Since the historical synthesis by Millar [1], Intrapenetrating Polymer Networks (IPNs) have been the subject of great importance from the technological point of view.

(IPNs) may be defined as a material consisting a pair of networks at least one of which has been synthesised and or crosslinked in the presence of other. If only one of the polymers is crosslinked, the product is referred to as a semi-IPN. Studies of semi- and fully IPNs have been reported by group of authors [2-10].

A number of distinct ways of preparing IPNs have been developed, these materials are conveniently classified according to method of synthesis, the types includes sequential IPNs, simultaneous IPNs, late IPNs and thermoplastic IPNs. For a full review of IPNs see References [11,12].

In the ideal case interpenetration will occur on a molecular scale. However, most IPNs show limited miscibility and phase separation occurs to some extent depending on the compatibility , the extent of crosslinking , method of synthesis and composition.

In the present work some new simultaneous IPNs based on epoxy-acrylate ester of 2,4,6-trimethylol phenol were synthesised with different composition, the ratio of epoxy /acrylate ester was varied with 90/10, 85/15, 80/20, 75/25 and 50/50.

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