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SETTING STUDY OF SOME NEW ACRYLATED SULPHONIC RESINS

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ABSTRACT - A new tetramethylol sulphonic resin bis [3,5-di(hydroxymethylene)-4-hydroxy] phenyl sulphone I was synthesisd by condensation of 4,4'- (dihydroxydiphenyl) sulphone with formaldehyde in the presence of basic catalyst.
The resin I was characterised, studied and transferred to its acrylate derivative by its condensation with acrylic acid inthe presence of acidic catalyst. The unsaturated acrylate resin II was characterised by various techniques.
The setting chracteristics of the resins I and II were studied by two techniques, moisture evolution analysis and DSC thermal analysis. The setting reaction of the resins were studied isothermally at a temperature range (50-130 °C) and as a function of temperature at constant heating rate 20 °C / min.
The activation energy for setting reactions was determined and fonud to be (14.0, 30.1) KJ/mole for the two resins respectively while the activation energy of the dehydration reaction of the resin I was found to be (5.8)KJ/mole as determined by ME A technique.
The expected setting reaction mechainsm for the resins is also included which involves the occurance of several setting reactions, i.e. dehydration,dehydroformylation and the crosslinking addition setting reaction of the acrylate groups.
The resin II shows incouraging physical and mechanical characteristics as compositing material either alone or with commercial unsaturated polyester[1].

INTRODUCTION

The unsaturated polyesters are one of the growing interest classes of polymeric materials due to their wide range applicatcn : reinforced plastics primarly with fiber glass as reinforcing agent[1] and they are used as setting resins for hot, cold and contact molding, on the other hand the favourability of the unsaturated polyesters is due to their convenient curing conditions and the simplicity of their proccessing to the final products.

In the last decades large number of new unsaturated polyester resins were synthesised and studied in the hope of improving their characteristics and to over come their disadvantages, e.g. flame retardant[3], improving the curing characteristics[4], developing resins with outstanding mechanical properties and with increased chemical and solvent resistance[5-7].

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