



ORIGINAL ARTICLE

# Synthesis, characterization of novel interacting blends of acrylated poly(ester-amide)s containing epoxy residues with vinyl ester resin



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## KEYWORDS

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Acrylated unsaturated resins;  
Glass reinforced composites;  
Vinyl ester epoxy (VE) resin

**Abstract** Unsaturated bisamic acids were prepared by reaction between maleic anhydride and different aromatic diamines. Unsaturated poly(ester-amide) resin (UPEAs) was prepared by reaction of diglycidylether of bisphenol-A (DGEBA) with unsaturated bisamic acids. Acrylation of Unsaturated poly(ester-amide)s (UPEAs) was carried out to afford acrylated UPEAs resin (i.e., AUPEAs). Interacting blends of Acrylated unsaturated poly(ester-amide)s (AUPEAs) with vinyl ester epoxy (VE) resin were prepared. APEAs and AUPEAs were characterized by elemental analysis, molecular weight determined by vapor pressure osmometer and by IR spectral study and by thermogravimetry. The curing of interacting blends was monitored on differential scanning calorimeter (DSC). Based on DSC data in situ glass reinforced composites of the resultant blends have been prepared and characterized for mechanical, electrical and chemical properties. Unreinforced blends were characterized thermo-gravimetrically (TGA).

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## 1. Introduction

The epoxy resins are used in a large number of fields, including surface coatings, in adhesives, reinforced with carbon fiber

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(Shukla, 2006). The polyesters are most widely versatile materials and have broad spectrum of characteristics and wide applications ranging from aerospace to micro electronics. They are also important as laminating resins, molding composites, fibers, films, surface coating resins, fiber cushion (Khambete, 2007). Polyamides material used in the form of fibers as especially thermoplastics is of particular use in engineering applications. The glass fiber reinforced nylon plastics are now of substantial importance due to rigidity and creep resistance. Polyamides are also used in fiber application, automotive industries, valve covers, coatings (Ahmad et al., 2001).

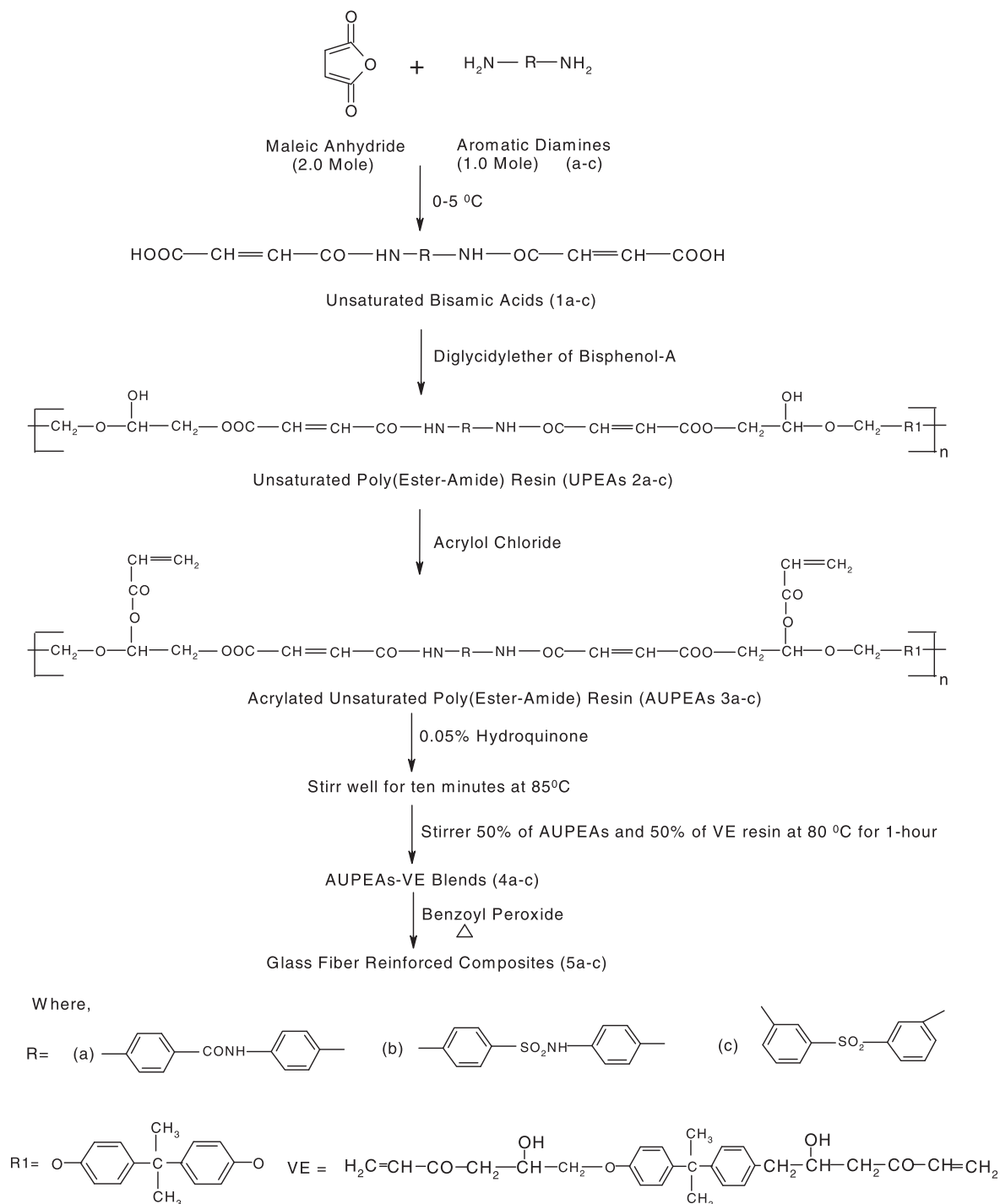
Merging of all the four unsaturation, epoxy, ester and amide segments into one polymer chain has not received attention academically and technically. Merging of all three



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segments (i.e., epoxy, ester and amide) into saturated and unsaturated polymer chains has been recently reported by Indian scientists (Patel and Panchal, 2005a,b, 2009a,b). Certain properties of thermoplastics may also be improved via blending or addition to an unsaturated resin is another possibility. In order to improve certain properties of such reported polymers their blending with commercial vinyl esters (epoxy resin) such as vinyl ester epoxy resin may

afford a commercially important material for wide industrial applications (Atta et al., 2006; Varma, 1986). Hence the present paper comprises interacting blending of reported unsaturated poly (ester-amide) resin with vinyl ester (VE) resin. Also, glass fiber reinforced composites of these blends have been laminated and characterized by chemical, mechanical and electrical properties. The whole work is shown in Scheme 1.



Scheme 1 Synthesis steps.

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