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## Synthesis and Characterization of Cross-Linkable Polysulfone with Acrylate or Imide Moiety for Flexible Display Substrate

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Glass substrate is commonly used for the display substrate. However, glass substrate has disadvantages that are heavy, easily fragile, and expensive to produce. Plastic substrates have flexibility, more light weight than glass substrate and high impact resistance. Recent, there are many researches for polysulfone(PSU), polyethersulfone(PES), polycarbonate(PC), polyethylene terephthalate(PET) and cyclic olefin copolymers to plastic display substrate. Flexible display substrate should have excellent transparency, gas barrier properties, thermal stability, dimensional stability and chemical resistance.

In this work, we choose the polysulfone which is amorphous polymer with high glass transition temperature, good thermal and oxidative stability (decomposition range between 400 and 550 °C regardless of environment-under air, argon or vacuum), excellent strength and flexibility, resistance to extremes of pH values and low creep<sup>[1]</sup>. But it has poor chemical resistance. So, we have an interest in the structure modification of PSU which is introduced cross-linkable side chain.

We prepared photosensitive PSU having methylene methacrylate moiety from chloromethylated polysulfone. The cross-linkable polysulfone films were prepared by solvent casting method. The PSU introduced cross-linkable imide side chain represented excellent flexibility though increase of imide moiety. Their chemical resistance was confirmed by solubility test. And the thermal, mechanical and gas barrier properties were measured by TGA, DSC, UTM and MOCON test.

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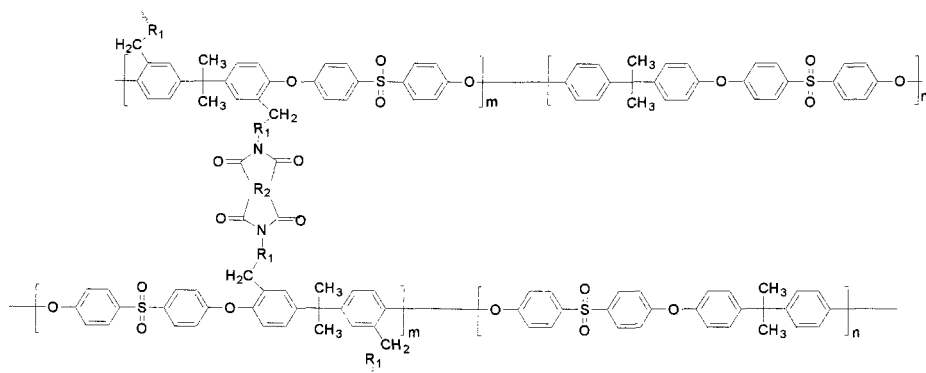


Figure 1. Cross-linked polysulfone with imide side chain.

### Reference

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