

## Polyamides containing high content of thioether units: synthesis and optical properties

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### Abstract

4,4'-bis(4-chloroformylphenylthio)benzene (BPB-DC) was synthesized in two steps and was reacted with diamine-containing thioether (-S-) and amide units to prepare a polyamide containing high contents of thioether groups. The intrinsic viscosities of the polyamides were 0.76-0.87 dl/g. These polyamides had excellent thermal properties, with glass transition temperatures ( $T_g$ ) of 234.8-269 °C and initial degradation temperatures ( $T_{5\%}$ ) of 461-469.7 °C. They showed improved solubility in polar aprotic solvents and could form moderate strength films with tensile strength of 75.2-111.6 MPa and storage modulus of 1.0-1.3 GPa (at 220 °C). These polymer films also had good optical properties, including an optical transmittance of the aromatic polyamide film at 450 nm that was higher than 90%. Additionally, the high quantity of thioether units provided the polymers with high refractive indices of 1.700-1.704 and low birefringences of 0.007-0.008.

**Keywords:** Polyamide; Refractive index; Birefringence; Soluble; Thermo-stability