Electroconductivity of So_3 doped Poly(p-phenylene sulfide)

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Poly (p-phenylene sulfide) films of several crystallinities were prepared with changing annealing conditions. The crystallinities were approximately determined by Differential Scanning Calorimetry.

Poly (p-phenylene sulfide) films were attached to a four-in-line probe apparatus that made it possible to monitor conductivity during doping. This apparatus allowed for continuous monitoring of conductivity over an extended time. Sulfur trioxide doping of PPS produced a material with an electrical conductivity as high as 10^{-4} S/cm at room temperature. The conductivity increased rapidly to a maximum within 30 min. of the initial exposure.

The electrical conductivity of Poly(p-phenylene sulfide) film proved to be particulary sensitive to the degree of crystallinity of undoped polymer. When an amorphous and an annealed films were exposed simultaneously at the same condition, the conductivity of an annealed film was higher than that of an amorphous film. The conductivity of film annealed at 240^{o}C for 30min. was twenty times as large as that of nearly amorphous film.