

The New Copolyimides from Diphenylether tetracarboxylic dianhydride, 4,4'-Diaminodiphenylether and 1,4-Diaminobenzene

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Abstract:

Polyimide is the comprehensive polymer. It exhibits high thermal resistance properties, good mechanical and electrical properties. The polyimide (Ratem YS-20) from 3,4,3',4'-diphenylether tetracarboxylic dianhydride (s-ODPA) and 4,4'-diaminodiphenylether (ODA) has been made by Shanghai Research Institute of Synthetic Resins. The polyimide is demanded to exhibit higher thermal properties (higher Tg) and better processability with development of science and technology. The new polyimides were polymerized from 2,3,3',4'-diphenylether tetracarboxylic dianhydride (a-ODPA) and 4,4'-diaminodiphenylether (ODA) in dimethylacetamide (DMAc) using chemical imidization. It was molded under high temperature and pressure. These kinds of polyimides have already been reported. We are trying to synthesize the new copolyimides made from diphenylether tetracarboxylic dianhydride (ODPA), ODA and 4,4'-diaminobenzene(PDA) for increasing Tg and improving processability. Two kinds of ODPA are used. They are 3,4,3',4'-diphenylether tetracarboxylic dianhydride (s-ODPA) and 2,3,3',4'-diphenylether tetracarboxylic dianhydride (a-ODPA). The thermal properties of copolyimides were studied by TGA, DSC and DMA. Their properties are impressive. The new copolyimides exhibit better thermal properties than that of YS-20. They also exhibit good mechanical properties. The copolyimides made from a-ODPA are soluble in some organic solvents such as N-methylpyrrolidone (NMP), dimethylformamide (DMF), DMAc, etc. They possess higher Tg and better processability than that of copolyimides derived from s-ODPA. These copolyimides could be applied in astronautics, aircraft, automobile and microelectronics fields.

Reference

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