Preparation of benzophenone-containing polyimide -poly(*p*-tolylsilsesquioxaane) hybrid materials by sol-gel process under light irradiation and their properties.

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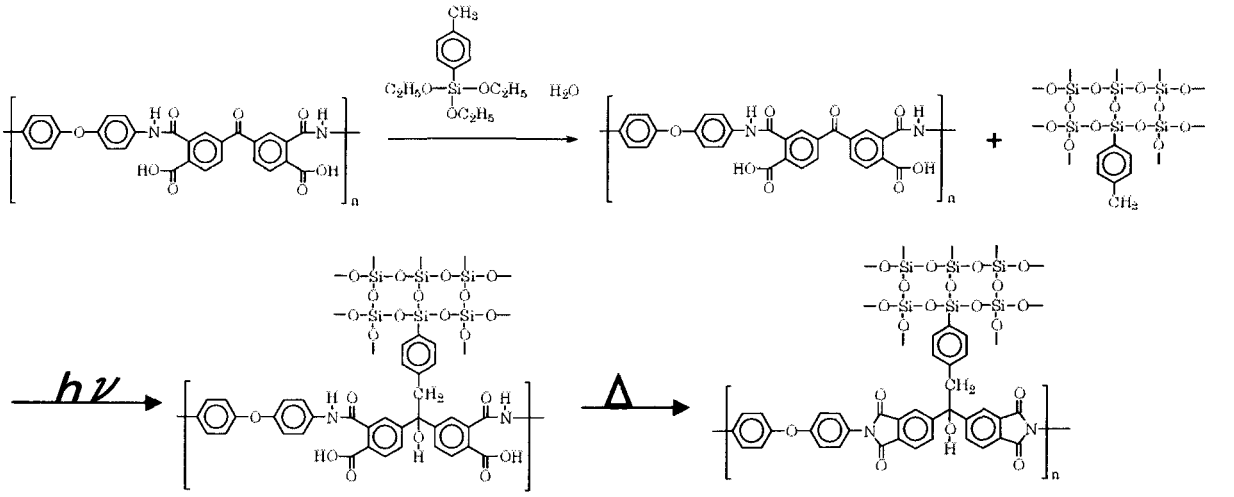
p-Tolyltriethoxysilane was hydrolyzed and polycondensed in the solution of polyamic acid derived from bis(4-aminophenyl)ether and 3,3',4,4'-benzophenonetetracarboxylic dianhydride in NMP. After the reaction mixture was homogeneous, the solution was irradiated by 365nm light. The polyamic acid film was prepared by casting the solution on a glass plate. After the film had been dried at 80℃ for 6h, the poly(*p*-tolylsilsesquioxaane)- polyimide hybrid films was obtained by successive heating at 100℃ for 1h, 200℃ for 1h, and 300℃ for 1h under vacume. The silsesquioxaane particles with a diameter of around 1-3 μ m were observed in the matrix polyimide by scaning electron microscopy. The size of silica particles decreased by light irradiation time. Result of dynamic-mechanical analysis indicated that movement of the polyimide chain in the matrix was restricted, and suggested formation of chemical bond between polyimide and poly(*p*-tolylsilsesquioxaane) by photo-reaction between exited benzophenone and p-tolyl group [1].



Reference

[1] A. A. Lin, V. R. Sastri, G. Tesoro, and A. REsiser, *Macromolecules,* **21**(4), 1165-1169(1988).

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