Synthesis and Characterization of A Novel Series of Polyimides

Der-Jang Liaw*

Department of Chemical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan 106.

A series new monomers containing pyridine heterocyclic group and bulky pendent substituent units were synthesized with a modified Chichibabin reaction.[1], [2] Rigid-rod polypyridine polymers [poly(pyridine-imide); **PPI** and poly(pyridine-alt-alkylfluorene); **PPAF**] were prepared via polycondensation and characterized by ^{1}H and ^{13}C NMR, UV-vis, fluorescence spectroscopy, gel permeation chromatography, and thermal analyses. The derived polypyridine polymers were highly organosoluble in common organic solvents and exhibited good thermal stability. The mechanical properties of the poly(pyridine-imide) films obtained by solution casting and showed good mechanical properties. The optical properties of **PPI** exhibited the UV-vis absorption bands at the region of 223−400 nm and possessed strong fluorescent after protonation with acid. **PPAF** emitted intense blue light under UV irradiation in both the film and solution phases and the electronic and optical properties were consistent with the rigid-rod conjugated structure.

References

[1] Chichibabin, *J. Russ. Phys.-Chem. Sac.*, **37**, *1229* (1905).

[2] Weiss M. *J. Am. Chem. Soc.*, **74**, 200 (1952).

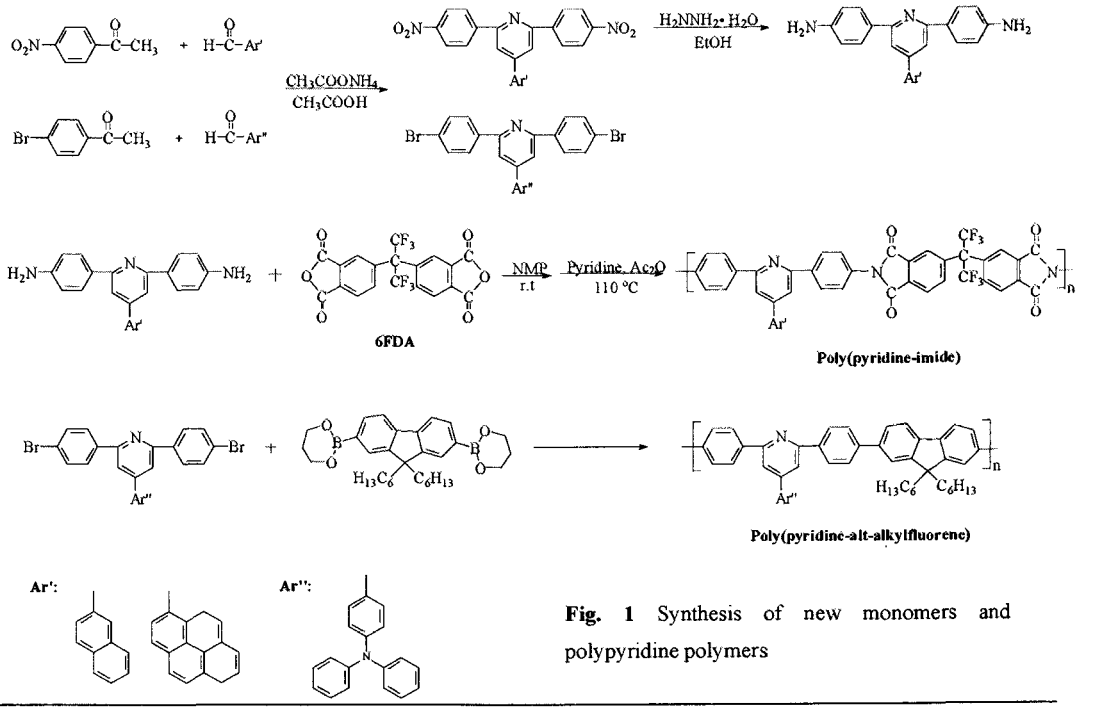

Fig. 1 Synthesis of new monomers and polypyridine polymers

Correspondence : e-mail liaw@ch.ntust.edu.tw; TEL +886-2-2737-6644; FAX + 886-2-2378-1441