

Abstract Submitted
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Synthesis and Characterization of Plant based Polythiophene Copolymers for Light Harvesting Applications¹ UDARI KODITHUWAKKU, PRASHANTHA MALAVI ARACHCHI, DILRU RATNAWEERA, University of Sri Jayewardenepura, Sri Lanka — Polythiophenes became more attractive in diverse applications due to some of their inherent properties including thermal and environmental stability as well as optical and electronic conductive properties. Commonly thiophene monomers are obtained from byproducts of crude oils. The current study discuss for the first time the synthesis and characterization of light harvesting polythiophenes copolymers from thiophene derivatives extracted from *Tagetes* species. There were mainly two thiophenes derivatives, 5-(3-buten-1-ynyl)-2, 2-bithienyl and 2, 2', 5, 2''-terthienyl (terthiophene), in the roots of the plant. Chemical oxidative radical polymerization was followed during the synthesis of copolymers with various block compositions of plant based terthiophenes and 3-hexyl terthiophenes. Structural characterization of the synthetic products was done using FTIR, NMR, Uv-vis, XRD and DSC techniques. Polythiophene homopolymers obtained from plant based terthiophenes have limited processability of solar cells due to poor solubility in common organic solvents. A significant solubility improvement was observed with copolymers having minor contributions of 3-hexylthiophenes.

¹Research Grants, University of Sri Jayewardenepura, Sri Lanka

Udari Shyamika Kodithuwakku Arachchige
University of Sri Jayewardenepura

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