

DICYANOISOPHORONE BASED SOLID STATE EMITTERS FOR ORGANIC LIGHT EMITTING DIODES

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Donor-Acceptor based solid state emitters are promising candidates for organic light emitting diodes (OLED's), solid-state lasers, sensors etc., owing to their ease of fabrication and tunable structures.^{1,2} In this regard, dicyanoisophorone can act as a strong acceptor unit in combination with a series of donor units of varying strength for the design of efficient materials because non-linear optical activity (NLO) and charge transporting properties of semiconducting devices are highly influenced by nature of donor, -bridge and acceptor fragments.^{2,3} In a recent report, NLO susceptibility of (E)-2-(3-(4-bromostyryl)-5,5-dimethylcyclohex-2-en-1-ylidene)malononitrile is found to be higher than that of the previously reported compounds.⁴ In continuation to our interest to develop novel bipolar materials for semiconducting devices, a series of novel D–A compounds were designed and synthesized based on (E)-2-(3-styryl-5,5-dimethylcyclohex-2-en-1-ylidene)malononitrile as an acceptor unit and thianthrene, phenoxathiine, carbazole, and fluorene fragments as donors. Photophysical, thermal, electrochemical, and electroluminescent properties of the materials were studied to establish the structure-property relationship. Conclusively, the newly synthesized D-A materials can also be suitable for photonic and optical devices particularly for organic photodetectors.

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