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Effect of the Linkers Between 9,9-Dimethylfluorenyl Terminal Moiety and a-Cyanoacrylic Acid Anchor on the λ_{max} of the UV Spectrum and the Energy Efficiency in Dye-Sensitized Solar Cell (DSSC)

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Six metal-free organic dyes having thiophene (1), benzene-thiophene (2), thiophene-benzene (3), thiophene-pyridine(4), thiophene-thiophene (5), and pyridine (6) linkers between 9,9-dimethylfluorenyl terminal group and α-cyanoacrylic acid anchor were synthesized. Among them, organic dye 5 showed the longest λmax value (424 nm) in UV-Vis absorption spectrum, better incident monochromatic photon-to-current conversion efficiency (IPCE), highest short circuit photocurrent density (JSC, 9.33 mA2/cm2), and highest overall conversion efficiency (η, 3.91%).