

ELECTRONIC SUPPLEMENTARY INFORMATION (ESI)

Improved molecular architecture of D- π -A carbazoles dyes : 9% PCE with Cobalt redox shuttle in dye sensitized solar cells

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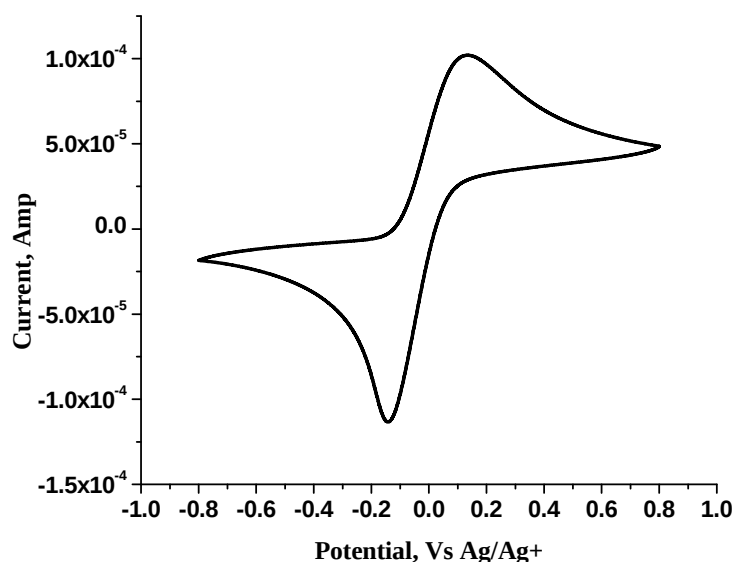
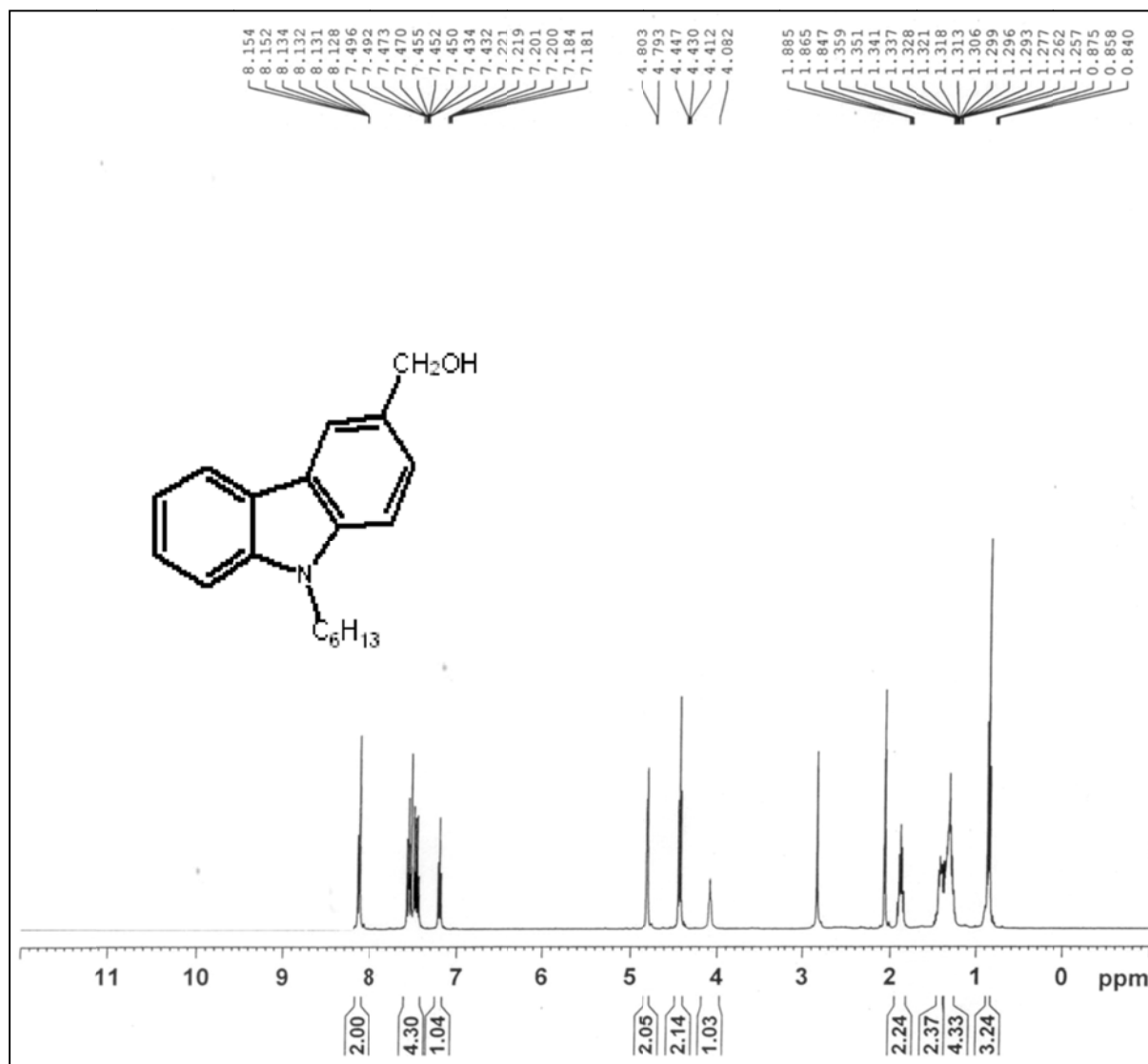


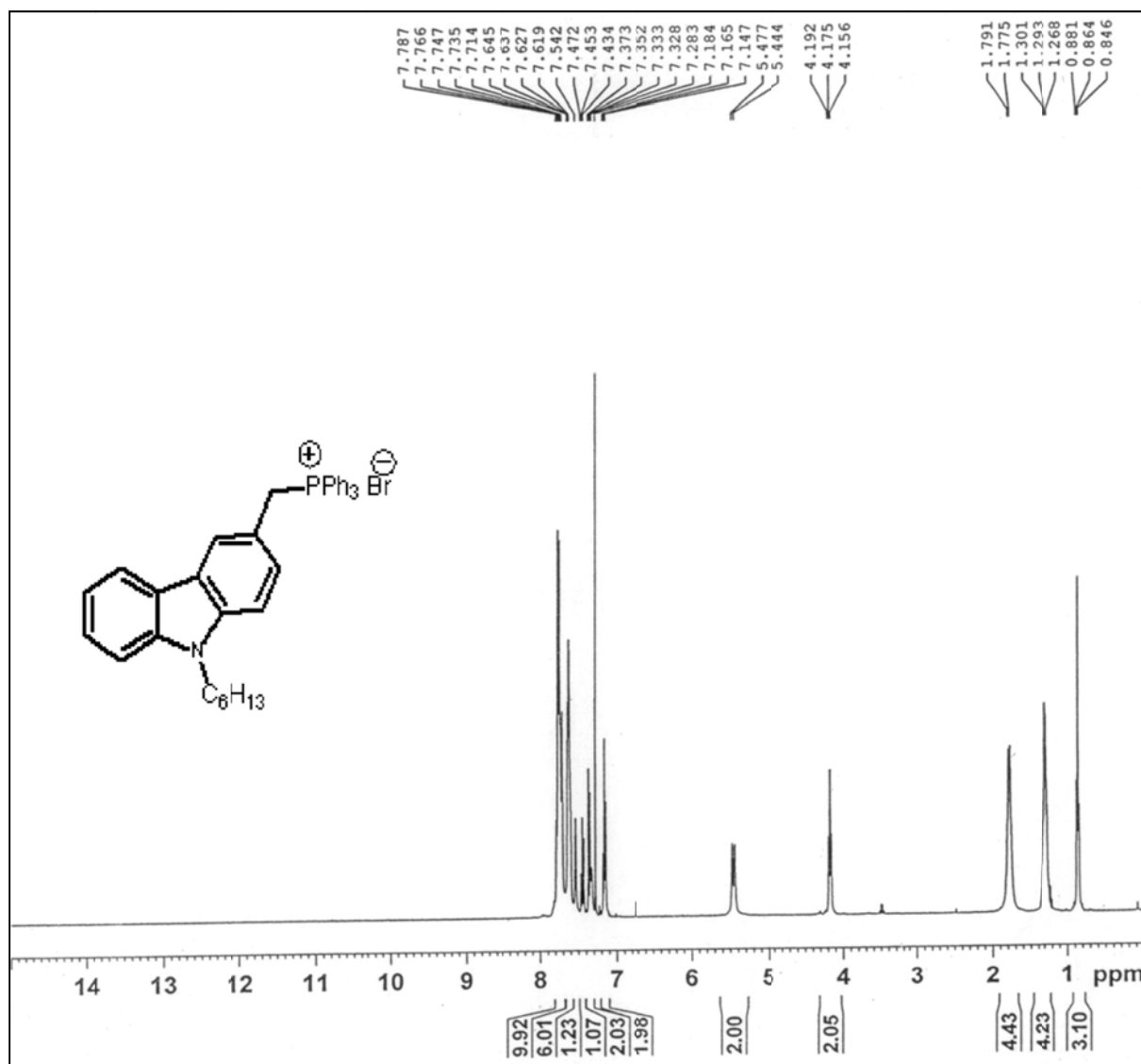
Fig. S1 CV of cobalt redox mediator

¹H NMR

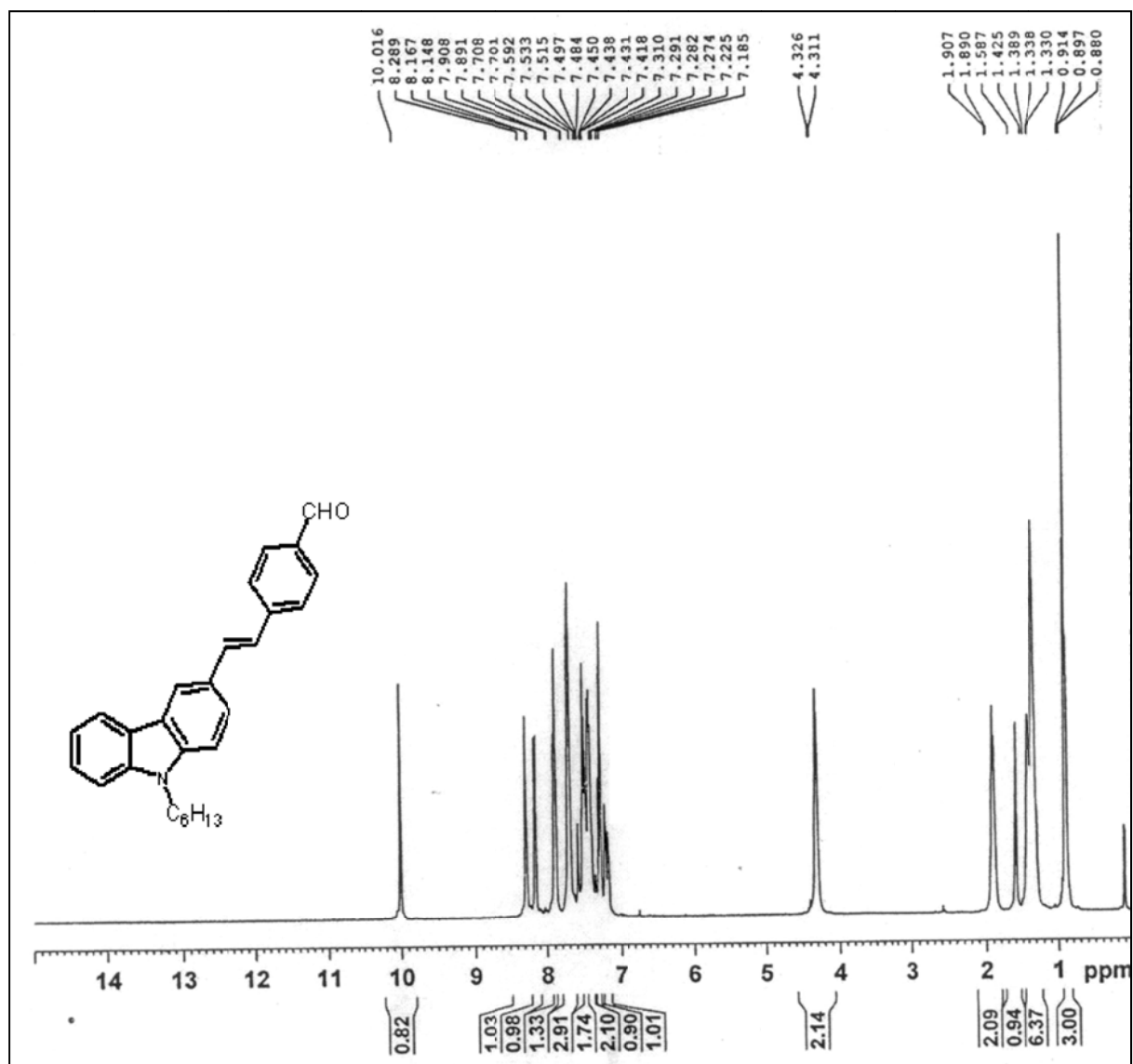
3] 9-hexyl-9H-carbazol-3-yl)methanol



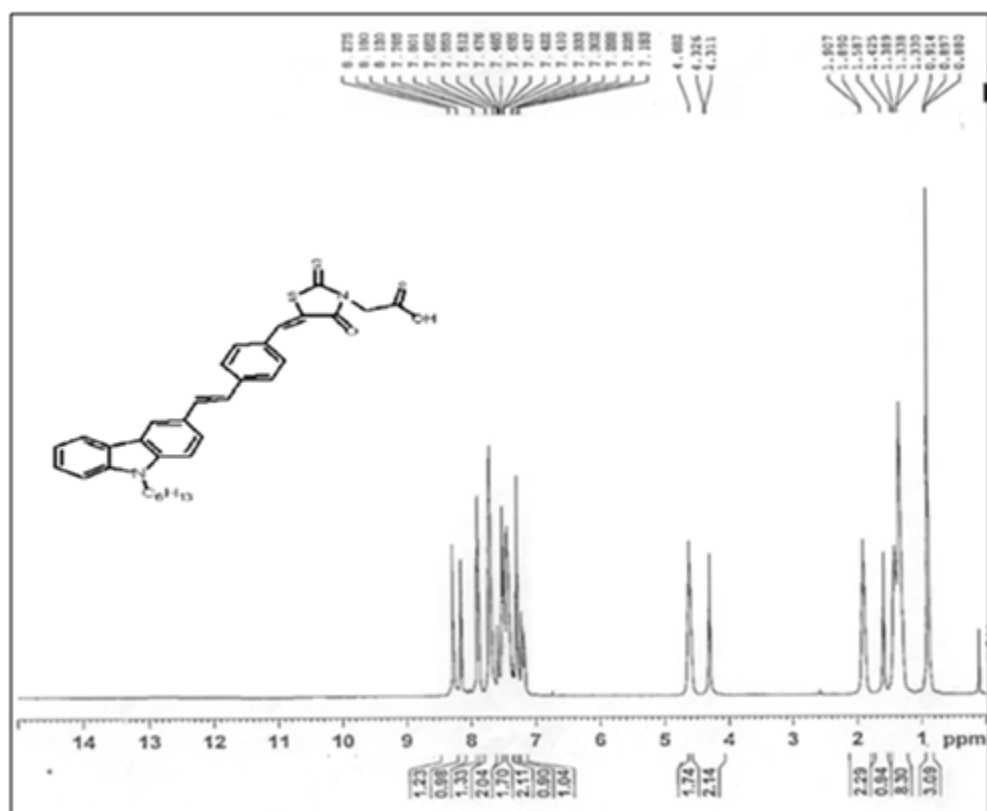
4] ((9-hexyl-9H-carbazol-3-yl)methyl)triphenylphosphonium bromide



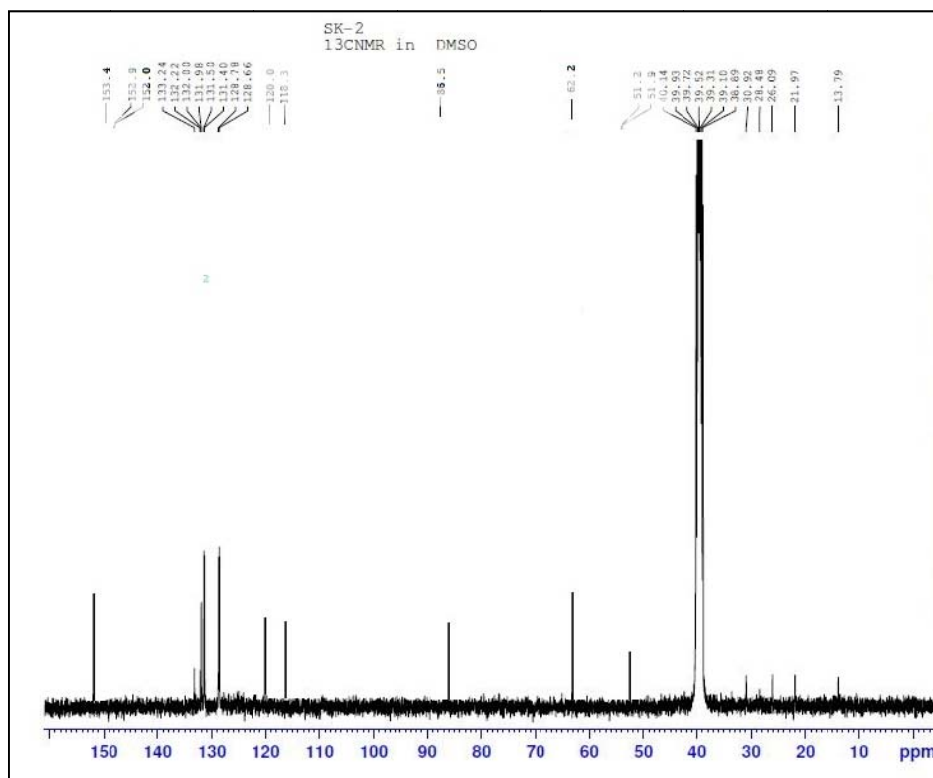
5] 4-(2-(9-hexyl-9H-carbazol-3-yl)vinyl)benzaldehyde



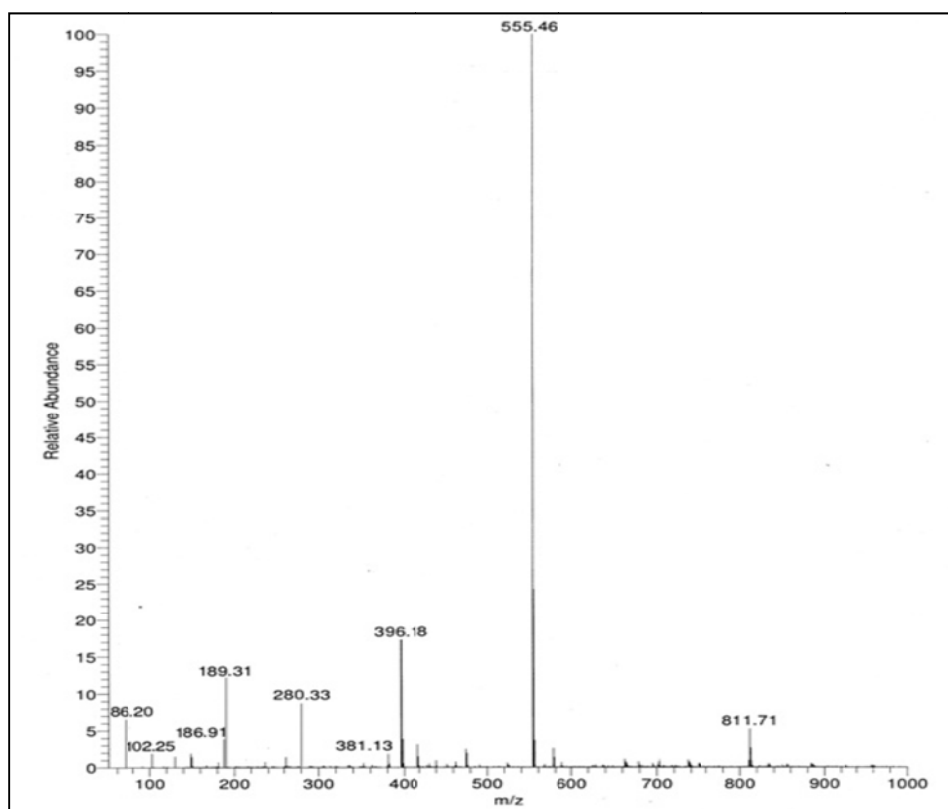
2-(-5-(4-(-2-(9-hexyl-9H-carbazol-3-yl)vinyl)benzylidene)-4-oxo-2-thioxothiazolidin-3-yl)acetic acid (**SK2**)



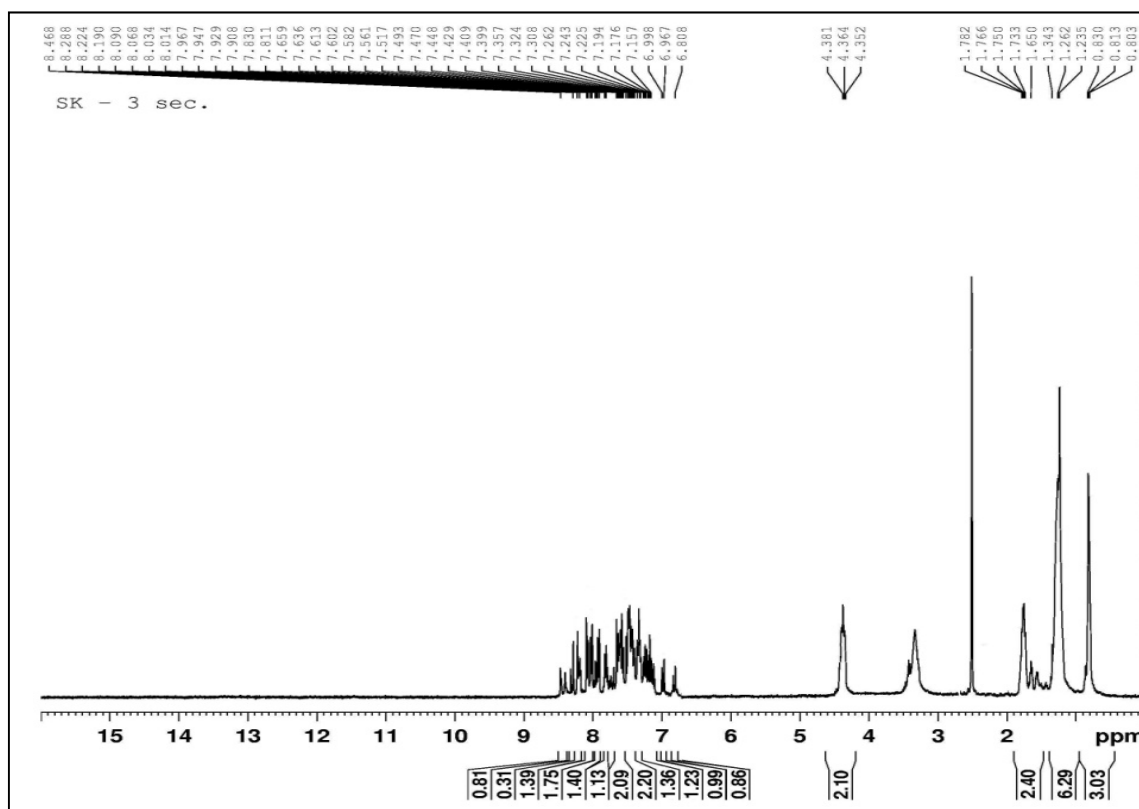
^{13}C NMR



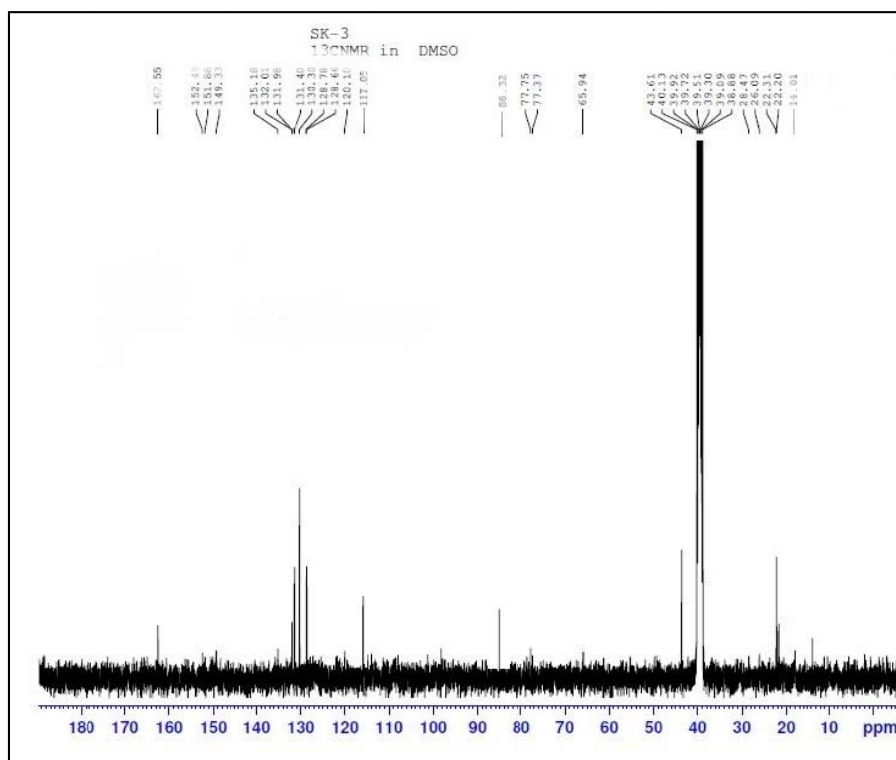
Mass Spectroscopy



2-cyano-3-(4-(-2-(9-hexyl-9H-carbazol-3-yl)vinyl)phenyl)acrylic acid (**SK3**)



^{13}C NMR



Mass Spectroscopy

