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Color gradation of substituted polyacetylenes: Molecular design, synthesis, and characterization of their helical structures

Main-chains in substituted polyacetylenes (SPAs) are twisted into a helical structure in order to avoid steric hindrances between neighboring side-chains. We have previously demonstrated that the color of SPAs having phenyl rings, called poly(arylacetylene)s (PAAs) strongly depended on molecular structure of the side-chains in their aromatic ring and on solvents using by the polymerization reaction. In this work, we focused on relationship between color of PAAs and their helical structures. Designed PAAs having phenyl or naphthyl rings were synthesized and characterized to elucidate precise helical structures containing degree of twist and distance of aromatic rings in side-chains

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