Abstract
Cyclopentadienone derivatives can be converted via a Diels-Alder reaction to multifunctional terephthalate derivatives, which can then be converted to poly(phenylene vinylene) derivatives. It was demonstrated that terephthalate derivatives can be simply and reproducibly synthesized from 2,5-diethoxycarbonyl-3,4-diphenylcyclopentadienone with a variety of acetylenes, having yields ranging from 63% to quantitative yields. The terephthalate derivatives synthesized varied from oils to crystalline solids, but were readily isolated and generally had high rates of completion despite expected steric factors. Terephthalate derivatives with pendent acetylenes were formed in reactions with as low as a 3:1 ratio of diacetylene to cyclopentadienone. A terephthalate derivative with a pendent carbohydrate function was also synthesized using the same method. Characterization of the terephthalate derivatives was accomplished by 1H NMR, 13C and related DEPT 135 NMR, IR, and elemental analysis with overall conclusive results. Melting points of the terephthalate derivatives varied widely and were not useful in characterization. A one-pot procedure for Huisgen 1,3-dipolar cycloaddition was developed for “clicking” the alkynyl terephthalates with azides in situ to yield 1,4-disubstituted 1,2,3-triazoles. The dipolar cycloaddition reactions had yields ranging from 32% to 75% and purification of these products was difficult.