Synthesis of First Generation Dendrimers Containing Azobenzene in the Periphery

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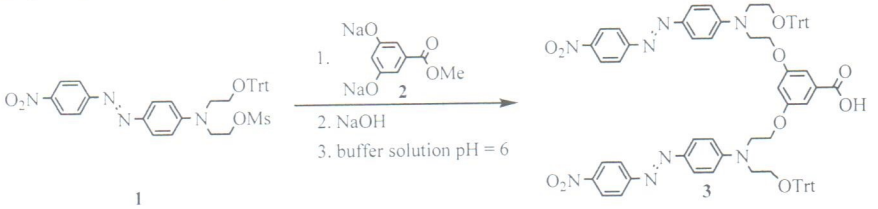
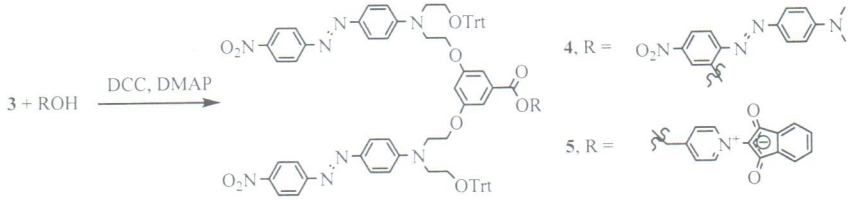
The aim of this work is to synthesize first generation dendrimers with two different chromophores in the molecule – neutral in ground state push-pull azobenzene and zwitterionic pyridinium betaine – for further studies of optical and nonlinear optical (NLO) properties. To enhance chromophore NLO effectivity bulky trityl groups are connected to periphery azobenzene to prevent dipole-dipole interactions and to allow parallel orientation of azobenzene moieties.

4-[*N,N*-Bis(2-hydroxyethyl)amino]-4'-nitroazobenzene reacted with trityl chloride in the presence of NEt_3 to yield 4-[*N*-(2-hydroxyethyl)-*N*-(2-trityloxyethyl)amino]-4'-nitroazobenzene. Subsequent reaction with mesyl chloride in the presence of DIPEA gave 4-[*N*-(2-mesyloxyethyl)-*N*-(2-trityloxyethyl)amino]-4'-nitroazobenzene (**1**) in excellent yield.



Alkylation of methyl 3,5-dihydroxybenzoate disodium salt (**2**) with azobenzene **1** in DMF yielded first generation dendron, and after consecutive treatment with NaOH in DMF and phosphate buffer solution of pH = 6, reactive dendron **3** was obtained.



First generation dendrimers **4** and **5** were obtained in the reaction of dendron **3** with hydroxycompounds ROH and DCC catalyzed by DMAP.