

Polyester bis-MPA dendrons are available from Polymer Factory and Sigma Aldrich with thiol functionality at the core, with these dendrons having a unique ability to act as bifunctional linkers in biochemistry and materials science. These are readily functionalized through thiol-ene “click” chemistry (TEC) with a range of alkenes. The dendrons are available with hydroxyl and protected amine functionality at the periphery for further modification.

## Protocol: coupling of alkene to thiol-functional dendron

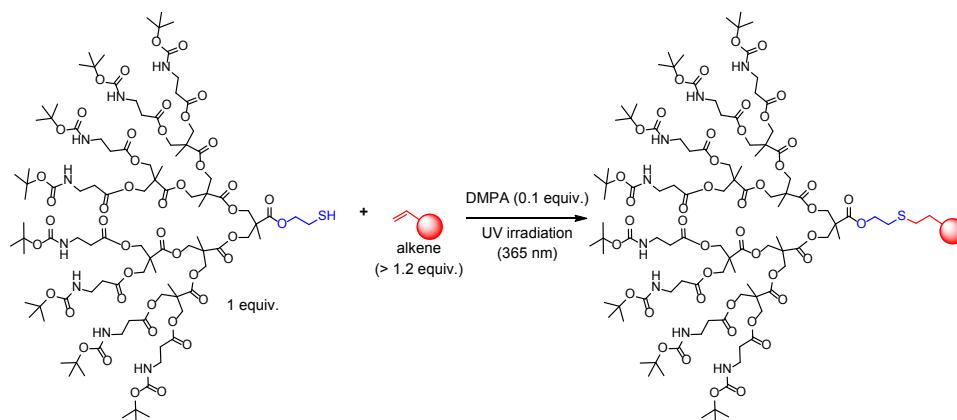


Figure 1: Example reaction scheme for functionalization of core thiol

- Dissolve the thiol functional dendron (1 equiv.), DMPA (0.2 equiv) and alkene ( $\geq 1.2$  equiv.) at room temperature with stirring. A wide range of solvents are tolerated, including water, methanol, acetonitrile, DMSO, DMF and THF. The solvent should be chosen to dissolve well all reactants.
- Deoxygenate the reaction mixture *via* purging with inert gas (N<sub>2</sub> or argon) for 15 minutes.
- Irradiate the reaction mixture with 365 nm UV light for 1 hour.
- Follow the reaction with MADLI-TOF MS, monitoring the appearance of the mass corresponding to the product, or with <sup>1</sup>H-NMR monitoring the shift of the peak corresponding to the CH<sub>2</sub>-SH (ca. 2.80 ppm, 2H) protons shifts upfield (ca. 2.60 ppm, CH<sub>2</sub>-SS-, 2H)
- When complete, evaporate the solvent and purify *via* flash column chromatography. Higher molecular weight products may be purified by dialysis.

## Reference

- MV Walter, M Malkoch *et al.* “Novel Macrothiols for the Synthesis of a Structurally Comprehensive Dendritic Library using Thiol–Ene Click Chemistry” *J. Polym. Sci. A Polym. Chem.*, **2011**, 49(13), 2990-2995.

## Disclaimer

The “click” coupling reactions are well established, and are robust and thoroughly investigated by the scientific community. However, these protocols are intended to serve as a guide for your own research, and are not guaranteed to work with all substrates.

## Thiol dendrons available from Sigma-Aldrich

Product Name	Generation	Functional groups	
		Core	End group ( <i>n</i> )
Polyester bis-MPA dendron, 8 hydroxyl, 1 thiol (core)	3	Thiol	OH (8)
Polyester bis-MPA dendron, 16 hydroxyl, 1 thiol (core)	4	Thiol	OH (16)
Polyester bis-MPA dendron, 32 hydroxyl, 1 thiol (core)	5	Thiol	OH (32)
Polyester bis-MPA dendron, 2 NHBoc, 1 thiol (core)	1	Thiol	NHBoc (2)
Polyester bis-MPA dendron, 4 NHBoc, 1 thiol (core)	2	Thiol	NHBoc (4)
Polyester bis-MPA dendron, 8 NHBoc, 1 thiol (core)	3	Thiol	NHBoc (8)
Polyester bis-MPA dendron, 16 NHBoc, 1 thiol (core)	4	Thiol	NHBoc (16)