

Oxa-Michael Addition Polymerization – Hydroxyethyl acrylate and N-Hydroxyethyl acrylamide

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The Michael addition between thiols and electron-poor olefins is categorized as a click reaction and finds wide application in polymer and materials chemistry in particular in its nucleophile mediated variant [1]. We became interested whether it is feasible to use less acidic and less nucleophilic alcohols instead of thiols and disclosed a nucleophile induced oxa-Michael addition polymerization reaction using divinyl sulfone and di- and polyols [2,3].

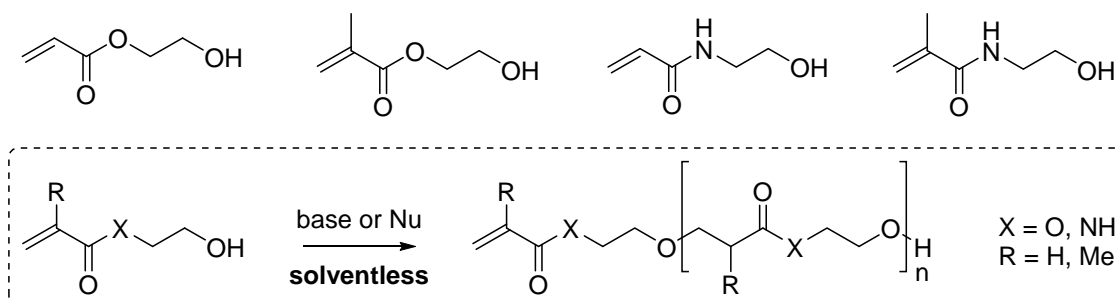


Figure 1. Oxa-Michael addition polymerization of (meth)acrylates and (meth)acrylamides.

Herein we aim at changing the Michael acceptor from divinyl sulfone to other electron deficient olefins such as acrylates, methacrylates, acrylamides and methacrylamides as depicted above. In particular we were interested whether an addition polymerization reaction is feasible with Michael acceptors being distinctly less reactive than divinyl sulfone. In particular, the role of the different nucleophiles and/or bases needed to initiate or catalyze the reaction is studied as the decisive factor for successful oxa-Michael addition polymerization.

[1] D. P. Nair, M. Podgorski, S. Chatari, T. Gong, W. Xi, C. R. Fenoli, C. N. Bowman, *Chem. Mater.* **2014**, 26, 724-744.

[2] S. Strasser, C. Slugovc, *Catal. Sci. Technol.* **2015**, 5, 5091-5094.

[3] S. Strasser, C. Wappl, C. Slugovc, *Polym. Chem.* **2017**, 8, 1797-1804.