

Hydrophobization of resorcinol-formaldehyde gels

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The chemical modification of aerogels and xerogels at their surface can drastically change their properties. The wetting behavior of silica aerogels, for example, is reverted upon trimethylsilylation. While silylation using trimethylsilyl chloride is routinely applied to silica gels on an industrial scale, only few examples of the silylation of organic gels such as resorcinol-formaldehyde (RF) xerogels are known, and these are basically restricted to trimethylsilyl and related unhindered moieties.^[1-3] The trimethylsilylation of RF gels has been shown to provide hydrophobicity for a limited time before the silyl ethers hydrolyze in aqueous environment.^[3]

In solution phase organic chemistry, phenols are often modified (“protected”) as silyl ethers owing to the high chemoselectivity of silyl reagents and the mildness and orthogonality of their removal. However, in case of sterically and/or electronically more demanding alcohol substrates, more activated silyl reagents and corresponding bases have to be used in order to achieve acceptable yields.^[4]

We have investigated the silylation of resorcinol-formaldehyde gels in solution using a number of sterically demanding silyl reagents and amine bases. This poster describes the functionalization of resorcinol-formaldehyde gels and their resulting long-term hydrophobic properties as determined by contact angle measurements over the course of several months.

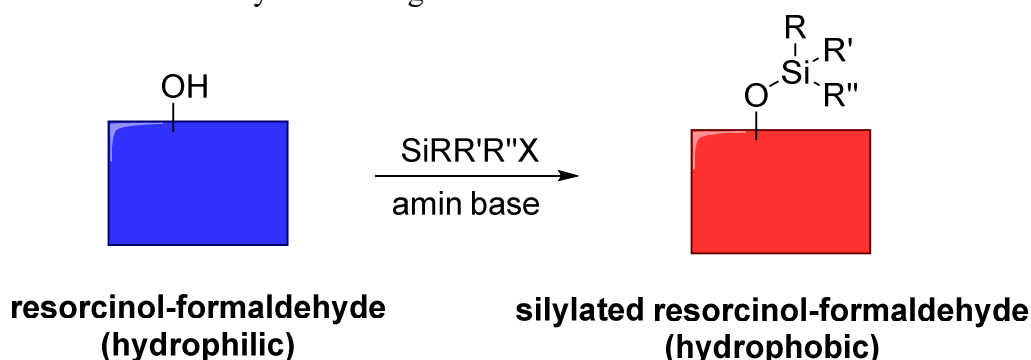


Figure: Silylation of resorcinol-formaldehyde rendering it hydrophobic.

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