



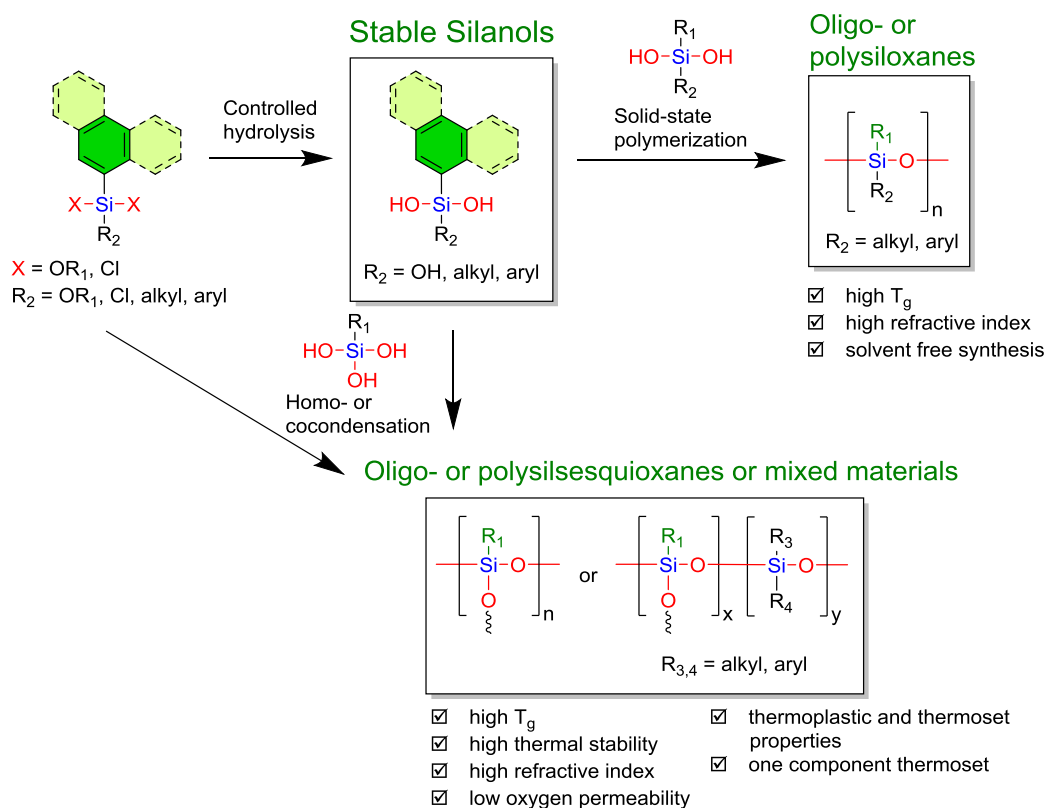
Stable Molecular Silanols as Precursors for Silsesquioxane- and Siloxane-Based Materials

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Contrary to alcohols, organosilanols can form stable diols or triols under certain conditions. The stability of the compounds is mainly influenced by the substitution pattern at the silicon atom and the chemical environment. In many processes, e.g., the sol-gel process or the formation of polysiloxanes, they are only present as intermediates and cannot be isolated. Many of the mentioned processes are kinetically driven, and control over the final morphology of the material is limited. Isolation of stable silanols and their use as precursors for the formation of oligo- or polysiloxanes as well as silsesquioxanes can lead to a more controlled pathway for the formation of these materials.

Here we present the synthesis of stable silanediol and triol molecules containing aromatic substituents. These systems can be isolated and handled under ambient conditions and used as precursors for various materials such as oligo- or polysiloxanes and oligo- or polysilsesquioxanes. In many cases, the stability of the silanol group in the final product plays an important role in its properties, which will also be shown in the presentation.



References

- [1] N. Steinbrück, S. Pohl, G. Kickelbick, *RSC Adv.* **2019**, 9, 2205-2216.
- [2] S. Pohl, O. Janka, E. Füglein, G. Kickelbick, *Macromolecules* **2021**, 54, 3873-3885.
- [3] J.-F. Kannengiesser, M. Briesenick, D. Meier, V. Huch, B. Morgenstern, G. Kickelbick, *Chem. - Eur. J.* **2021**, 27, 16461-16476.
- [4] M. Briesenick, M. Gallei, G. Kickelbick, *Macromolecules* **2022**, 55, 4675-4691.