SERS characterization of photo-induced dimerization

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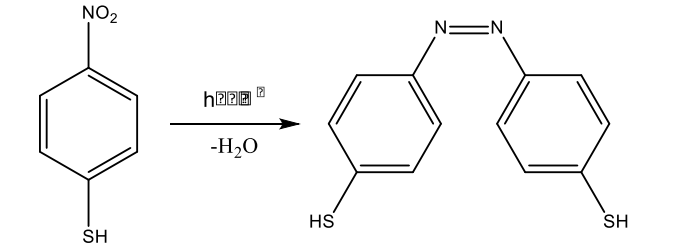
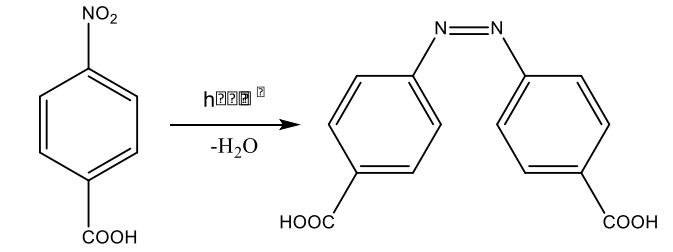
Dimercaptoazobenzene (DMAB) can be formed from different precursors (e.g., *p*-Nitrothiophenol and *p*-Aminothiophenol, see also examples in Figure) by a reaction that can be influenced by localized surface plasmons.[1] Many reaction parameters were shown to influence the pathway of DMAB formation.

The mechanism of DMAB formation is studied by surface enhanced Raman scattering (SERS). It is very interesting to delineate effects due to properties of the reacting molecular species and those related to the plasmonic properties of the nanostructures. Currently, we achieve this e.g., by the comparison of the usage of nanoparticle solutions and immobilized nanoparticles.[2] We perform this work, since we aim at modifying and controlling the reaction conditions precisely in microscopic volumes, exploiting the multifunctional properties of different plasmonic nanoparticles [3]. In our poster, we will show and discuss SERS data obtained in experiments at varying reaction and excitation conditions.



p-Nitrothiophenol p,p'-Dimercaptoazobenzene (DMAB)



p-Nitrobenzoic acid p,p'-Dicarboxyazobenzene

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[1] L. Zhao, M. Zhang, Y. Huang, C. T. Williams, D. Wu, B. Ren, and Z. Tian, The Journal of Physical Chemistry Letter. 5 (2014), 1259−1266.
[2] V. Joseph, M.Gensler, S. Seifert, U. Gernert, J. Rabe, and J. Kneipp. The Journal of Physical Chemistry C, 116(2012), 6859−6865
[3] V. Joseph, C. Engelbrekt, J. Zhang, U. Gernert, J. Ulstrup, and J. Kneipp, Angewandte Chemie- International Edition 51 (2012) 7592–7596.