

On the “soft template” effect of an enzymatic oligomerization reaction

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The oxidation of the aniline dimer, *p*-aminodiphenylamine (PADPA), with *Trametes versicolor* laccase and molecular oxygen was studied in aqueous solution at pH = 3.5. Depending on the experimental conditions used, oligomeric products are obtained, which originate from enzymatic as well as non-enzymatic follow-up reactions. The presence of dispersed anionic interfaces – also called “templates” – in the reaction mixture can have a significant and positive effect on the course of the reaction as with such templates products can be obtained which resemble the conductive emeraldine salt form of polyaniline (PANI-ES) [1-3]. Without templates, these products do not form. The effect of three different templates under their respective optimal conditions was investigated and compared in a systematic way by using UV/vis/NIR, EPR and Raman spectroscopy measurements, as well as an HPLC-MS analysis. The templates used were sulfonated polystyrene (SPS), micelles from sodium dodecylbenzenesulfonate (SDBS) – previously used by Shumakovich *et al.* [4] – and vesicles from sodium bis(2-ethylhexyl) sulfosuccinate (AOT). Although all three templates carry a sulfonate group and yield PANI-ES-type products, there are clear differences in the properties of the product mixtures obtained. Reasons for these differences are discussed.

Acknowledgments: We thank Louis Bertschi, MS Service Lab, LOC, ETHZ for his support in the ESI – MS measurements and Reinhard Kissner, LAC, ETHZ for his support in the stopped-flow measurements. SNF project numbers: 200020_150254 and IZ73ZO_152457. The second author received financial support for this study from the Japan Public-Private Partnership Student Study Abroad Program (TOBITATE!).

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