Short Communications

Electrochemical Evaluation of Nitroxyl Radical Catalysts and Electrochemical Detection of Cyclosporin A

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Nitroxyl radical catalysts oxidize alcohols under an applied electric potential. It is possible to quantify the alcohol concentration from the resulting oxidation current. In this work, we evaluated the catalytic activity of nitroxyl radicals (or their corresponding hydroxylamines), including 2,2,6,6-tetramethylpiperidine-1-oxyl (TEMPO) as representative nitroxyl radicals, acetoamido-TEMPO, which shows higher oxidation potential than TEMPO owing to the acetoamido group, AZADO, Nor-AZADO, and NNO as less-hindered bicyclic nitroxyl radicals, and NHPI as an *N,N*-diacyl-type hydroxylamine, in acetonitrile solution. TEMPO, AZADO and NNO were also evaluated for their ability to oxidize alcohols in organic solvents, and their reactivity was compared with the electrochemical response. The most active NNO was used for electrochemical detection of cyclosporin A, a drug with a hydroxyl group. An abstract stating the features and drawing attention to the novel aspects.

Keywords: nitroxyl radical; TEMPO; cyclosporine A; sensor

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