Mohamed K Abd El-Rahman et al., Expert Opin Environ Biol 2014, 3:3
http://dx.doi.org/10.4172/2325-9655.C1.009

OMICS International
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International Summit on Past and Present Research Systems of Green Chemistry

August 25-27, 2014 Hilton Philadelphia Airport, USA

A novel approach for spectrophotometric determination of succinylcholine in pharmaceutical formulation via host-guest complexation with water-soluble p-sulfonatocalixarene

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Succinylcholine(SUC) is a quaternary ammonium neuromuscular blocking agent. Direct determination of SUC in bulk drug and formulations is a challenginganalytical task due to the lack of a detectable chromophore and sensitive detection techniques. We have exploited both the strong UV absorbance of p-sulfonatocalix[4]arene (SCX4) and its outstanding complexation properties towards quaternary ammonium compounds to determine SUC. The characteristics of a host-guest complexation between SCX4 and SUC were investigated usingUV and 1H NMR spectroscopy. The Job's plot analysis reveals a1:1 stoichiometry of the host-guest complexwith a binding affinity K_{ass} of$7.8x10^4$L mol-1. This novel method is based on spectrophotometric measurement of the formed complex peak after resolving the overlap from the host SCX4spectrum and was usedfor the quantitation of SUC. The linear range was found to be from $1.0x10^{-5}$to $18.0x10^{-5}$mol L−1with a detection limit of$7.3x10^{-6}$mol L^{-1}(2.88µg mL^{-1}). This method is straightforwardand shows high sensitivity. Moreover, it was successfully employedto determineSUC in pharmaceutical formulation.Subsequent statistical analysis of the obtained results and comparison with the official US pharmacopeial benchmark yielded favorable results.

Biography

Mohamed K. Abd El-Rahman received his master's degree in 2008 and his PhD in 2011 in the field of analytical chemistry from Faculty of Pharmacy, Cairo University. He is working presently as lecturer in the department of Analytical Chemistry, Faculty of Pharmacy, Cairo University. His research interest includes supramolecular host-guest chemistry, development of ionophore-based ion selective electrodes for pharmaceutical analysis, spectroscopy and chromatography. He has published more than 10 research papers in different international journals of repute.

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