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Towards an Efficient Method of Detecting Cocaine Metabolite in Urine

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Poster Presentation 13

TOWARDS AN EFFICIENT METHOD OF DETECTING
COCAINE METABOLITE IN URINE

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The primary metabolite of cocaine is benzoylecgonine (BE). A desirable method for detecting cocaine use is the extraction of BE from urine into an organic phase solvent and subsequent analysis by High Performance Liquid Chromatography (HPLC). The attempt to develop such a method is hindered by the extreme water solubility of BE, making extraction into an organic phase extremely difficult. The present study attempts to use an ion-pairing agent to bind with BE and form a large, organically soluble ion-pair. The ion pairing agent used was a 1% solution of Reinecke Salt. An aqueous solution of 50 mg/mL BE was treated with the Reinecke Salt solution and then extracted with methylene chloride. Initial analysis of the extracted ion pair was performed by Ultraviolet-Visible (UV-VIS) spectrometry. The composition of BE is pH dependent; existing as a positively charged species in acid, a zwitterion in neutral solution, and a negatively charged species in base. The structural variation of BE at different pH levels was studied using the CACHE Molecular Modeling system. The pH dependence of BE results in a pH dependent ion pairing reaction; an ideal pH of 8.5 was determined. The extraction was then run with solutions of varying BE concentration. A concentration variant peak at 255 nm was discovered using UV-VIS spectrometry. The detection limit of this method and its application to HPLC will also be presented.