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Entitled

DEVELOPMENT OF A NEW ANALYTICAL METHOD FOR SEPARATION AND QUANTITATIVE DETERMINATION OF SYNTHETIC CATHINONES IN URINE USING GAS CHROMATOGRAPHY TANDEM MASS SPECTROMETRY

by

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Abstract

This thesis is concerned with a new class of drugs known as the new designer drugs (NDDs) which overruns the drug markets in recent years as “legal highs” drugs, under different commercial names such as bath salts. Bath salts are related to synthetic cathinones which a synthetic version of the natural stimulant cathinone (β -keto amphetamine) found in *khat* (*Catha edulis*) leaves. Khat, is the name of a flowering shrub grown mainly in some parts of Africa and the Arabian Peninsula, where people chew its leaves to produce a stimulant effect. All bath salts or synthetic cathinone derivatives consist of a chiral center and usually sold out as a racemic mixture. Usually, one of the two enantiomers will have stronger central nervous system (CNS) stimulatory activity and the other one may have no significant CNS activity or addictive properties. Therefore, it is necessary to develop an analytical method capable of separating and detecting the synthetic cathinone enantiomers to provide information regarding the sources of these drugs and the raw materials used to create them to help law enforcement agencies with the drug tracking. The main objective of this thesis is to develop and validate a sensitive and selective analytical method for qualitative and quantitative determination of synthetic cathinones enantiomers in spiked urine samples using gas chromatography coupled with tandem mass spectrometry (GC-MSMS). The method adopted the indirect chiral separation of the synthetic cathinones enantiomers using menthylchloroformate as the chiral derivatizing agent (CDA). The study goal was achieved successfully by developing and validating a method for chiral separation and quantitative determination of Ten (10) synthetic cathinones enantiomers in spiked urine samples.

Keywords: Synthetic cathinones, bath salts, enantiomers, derivatization, chiral separation, menthylchloroformate, chiral derivatizing agent, gas chromatography, tandem mass spectrometry.