

RASHED HUMAID AHMAD KHALFAN BIN HUZAIM ALREMEITHI

Department of Chemistry
College of Science



Dissertation

Title	<i>CHIRAL SEPARATION AND QUANTITATION OF KHAT DESIGNER DRUG – SYNTHETIC CATHINONES – IN URINE AND PLASMA</i>
Faculty Advisor	Dr. Mohammed A. Meetani
Defense Date	10 November 2016
Abstract	This dissertation is concerned with the latest class of the new designer drugs (NDDs) which overruns the world in the last few years as “legal high” drugs, under the name of bath salts or synthetic cathinones. Bath salts are a group of central nervous system stimulants that consists mainly of synthetic cathinone derivatives. In nature, cathinone (β-keto amphetamine) exists in the leaves of the <i>Catha edulis</i> plant which can be found easily in the region of northeast Africa and the Arabian Peninsula. All synthetic cathinone derivatives contain a chiral center and most probably sold out as a racemic mixture. Commonly, one of the enantiomers will have greater psychological effect in human biological system than the other one. Therefore it's important to distinguish between synthetic cathinone enantiomers. Enantiomeric separation and determination of these NDD's may give information about the source of these synthetic drugs and the raw materials that were used in the synthesis process and also facilitates the drug tracking. The main objective of this dissertation is to develop and validate sensitive and selective analytical methods that use direct and indirect chiral separation and quantitation for synthetic cathinones in real biological samples using chromatography coupled with mass spectrometer detector (MSD) and Diode Array detector (DAD). The study goals were achieved successfully by developing and validation of three different methods for chiral separation and quantitation for 10 compounds of synthetic cathinones. Enantiomer quantitation in urine and plasma were performed and reported for the first time in this study; also it's the first time to report the chiral separation of tertiary amine cathinones where we were able to separate 19 out of 22 of them.