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Development and validation of an analytical methodology for the simultaneous quantitative determination of synthetic cathinones in urine and plasma using GC-NCI-MS

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Development and validation of sensitive and selective method for enantioseparation and quantitation of synthetic cathinones “bath salts” has been done by using GC-MS with chemical ionization source in negative mode (NCI). Indirect chiral separation of thirty six synthetic cathinone compounds have been achieved by using optically pure chiral derivatizing agent (CDA) called (S)-(-)-N-(trifluoroacetyl)pyrrolidine-2-carbonyl chloride (L-TPC) which converts cathinone enantiomers into diastereoisomers that can be separated on achiral columns. As a result of using Ultra inert 60 m column and performing slow heating rate (2 °C/min) on the GC oven, an observed enhancement in enantiomer peaks resolution have been achieved. An internal standard, (+)-cathinone, was used for quantitation of synthetic cathinone. Method validation in terms of linearities, limits of detection (LOD), limits of quantitation (LOQ), recoveries and reproducibilities have been obtained for fourteen selected compounds that ran simultaneously as a mixture after being spiked in urine and plasma. It was found that the LOD's of the fourteen synthetic cathinones in urine was in the range of 0.02 - 0.76 ppb and in plasma it was in the range of 0.02 - 0.34 ppb. While the LOQ's of the mixture in urine was in the range of 0.07 - 2.31 ppb and in plasma it was in the range of 0.07 - 1.03 ppb. Unlike the Electron Impact ion source (EI), NCI showed higher sensitivity by three orders of magnitude by comparing with the previous results. The correlation coefficient (R^2) values for the mixture components was found to be higher than 0.99.

Biography

Rashed Humaid Alremeithi has completed his PhD at the age of 28 years from United Arab Emirates University. He is working at Dubai Police forensic laboratory. He has published 2 papers in reputed journals.

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