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Feasibility of gas chromatography-microchip atmospheric pressure photoionization-mass spectrometry in analysis of anabolic steroids

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Abstract

Mass spectrometers equipped with atmospheric pressure ion sources (API-MS) have been designed to be interfaced with liquid chromatographs (LC) and have rarely been connected to gas chromatographs (GC). Recently, we introduced a heated nebulizer microchip and showed its potential to interface liquid microseparation techniques and GC with API-MS. This study demonstrates the feasibility of GC–microchip atmospheric pressure photoionization-tandem mass spectrometry (GC–APPI-MS/MS) in the analysis of underivatized anabolic steroids in urine. The APPI microchip provides high ionization efficiency and produces abundant protonated molecules or molecular ions with minimal fragmentation.

The feasibility of GC–APPI-MS/MS in the analysis of six selected anabolic steroids in urine samples was studied with respect to intra-batch repeatability, linearity, linear range, and limit of detection (LOD). The method showed good sensitivity (LODs 0.2–1 ng/mL), repeatability (relative standard deviation < 10%), and linearity (regression coefficient ≥ 0.9995) and, therefore, high potential for the analysis of anabolic steroids. Quantitative performance of the method was tested with two authentic urine samples, and the results were in good agreement with those obtained with conventional GC–electron ionization-MS after derivatization.

For the complete paper, please, see the following reference:

Hintikka L, Haapala M, Franssila S, Kuuranne T, Leinonen A, Kostiainen R. (2010) Feasibility of gas chromatography-microchip atmospheric pressure photoionization-mass spectrometry in analysis of anabolic steroids. *J Chromatogr A* **1217**, 8290-8297.