Michael Polet, Wim Van Gansbeke, Koen Deventer, Peter Van Eenoo

Development of a sensitive GC-C-IRMS method for the analysis of androgens

Ghent University, Doping Control Laboratory, Zwijnaarde, Belgium

Abstract

The administration of anabolic steroids is one of the most important issues in doping control and is detectable through a change in the carbon isotopic composition of testosterone and/or its metabolites. Gas Chromatography-Combustion-Isotope Ratio Mass Spectrometry (GC-C-IRMS) however remains a very laborious and expensive technique and substantial amounts of urine are needed to meet the sensitivity requirements of the IRMS. This can be problematic because only a limited amount of urine is available for anti-doping analysis on a broad spectrum of substances. In this work we introduce a new type of injection which increases the sensitivity of GC-C-IRMS by a factor of 13 and reduces the limit of detection, simply by using solvent vent injections instead of splitless injection. This drastically reduces the amount of required urine. On top of that, by only changing the injection technique, the detection parameters of the IRMS are not affected and there is no loss in linearity.

For the complete paper, please refer to:
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