Preparation and chromatographic characterization of tetrahydrogestrinone (THG), a new "designer" anabolic steroid

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Abstract

Tetrahydrogestrinone (THG, (17α)-13β-ethyl-17β-hydroxy-18,19-dinorpregna-4,9,11-trien-3-one, $C_{21}H_{28}O_2$, 312 m.w.) is a synthetic 19-norsteroid closely related to gestrinone ((17α)-13β-ethyl-17β-hydroxy-18,19-dinorpregna-4,9,11-trien-20-yn-3-one, $C_{21}H_{24}O_2$, 308 m.w.) which was originally developed as an oral contraceptive for women. Recent press reports detail the probable use of THG by athletes to enhance athletic performance, and the FDA has banned THG, declaring it a "designer drug." THG has been difficult to analyze because of it instability, lack of commercially available analytical standards, and the fact that no published synthetic methods for the compound exist. We now report a method for the preparation of THG via the carefully controlled hydrogenation of gestrinone.

Keywords: Gas Chromatography, GC-MS, designer drug, anabolic steroid, synthesis

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