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Preconcentration and spectrophotometric determination of oxymetholone in the presence of its main metabolite (mestanolone) using modified maghemite nanoparticles in urine sample

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1 **Preconcentration and spectrophotometric determination of oxymetholone in the presence**
2 **of its main metabolite (mestanolone) using modified maghemite nanoparticles in urine**
3 **sample**

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7 **Abstract**

8 A novel and sensitive extraction procedure using maghemite nanoparticles ($\gamma\text{-Fe}_2\text{O}_3$) modified
9 with sodium dodecyl sulfate (SDS), as an efficient solid phase, was developed for removal,
10 preconcentration and spectrophotometric determination of trace amounts of oxymetholone
11 (OXM), in the presence of mestanolone (MSL). Combination of nanoparticle adsorption and
12 easily magnetic separation was used for the extraction and desorption of OXM. The preparation
13 of $\gamma\text{-Fe}_2\text{O}_3$ nanoparticles were obtained by co-precipitation method and their surfaces were
14 modified by SDS. The size and properties of the produced $\gamma\text{-Fe}_2\text{O}_3$ nanoparticles were
15 determined by X-ray diffraction analysis, FT-IR and scanning electron microscopy
16 measurements. OXM and MSL became adsorbed at pH 3.0. The adsorbed drugs were then
17 desorbed and determined spectrophotometrically using a selective complexation reaction for
18 OXM. The calibration graph was linear in the range 15.0–3300.0 ng mL⁻¹ of OXM with a
19 correlation coefficient of 0.9948. The detection limit of the method for determination of OXM
20 was 4.0 ng mL⁻¹. The method was applied to the determination of OXM in human urine samples.

21 **Keywords:** Oxymetholone; Mestanolone; Spectrophotometric determination; Maghemite
22 nanoparticles; Preconcentration.

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