

APPLICATION OF HPLC AND GLC IN THE ANALYSIS OF METRONIDAZOLE

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Introduction. Metronidazole is attributed to the group of antiprotozoal medicines and widely used for treatment of infectious diseases, at the same time it is possessed of quite a number of side effects showed by classic symptoms of acute intoxication, especially when interacting with alcohol.

Aim. The research purpose is to develop the conditions of metronidazole detection and identification by the methods of high-performance liquid and gas-liquid chromatography.

Materials and methods. Metronidazole of pharmacopoeial purity was used in the experiment; its solutions in ethanol with the concentration from 1 µg/mL to 0.1 µg/mL were prepared.

Conditions of HPLC-analysis (the volume of injection – 100 µL): device – MiLiChrome® A-02; column – Ø2×75 mm, reversed phase ProntoSIL-120-5-C18 AQ; temperature – 40°C; eluent A – 0.2 mole/l LiClO₄ – 0.005 mole/l HClO₄; eluent B – CH₃CN; flow – 100 µL/min.; gradient elution mode – linear from 5% to 100% CH₃CN for 40 min., then 100% CH₃CN for 3 min.; detector – UV-spectrophotometer (210, 220, 230, 240, 250, 260, 280, 300 nm).

Conditions of GLC-analysis (the volume of injection – 2 µL): device – HP 6890 Hewlett Packard; column – HP-1 Ø0.32 mm × 30 m, 0.25 µm, the thickness of layer of 100% dimethylpolysiloxane of 1 µm; temperature of the column thermostat – 70°C (3 min.), increasing the temperature with the rate of 40°C/min. to 180°C (keeping for 2 min.), increasing the temperature with the rate of 40°C/min. to 250°C (keeping for 3 min.); injector temperature – 280°C; detector – flame-ionization; detector temperature – 280°C; volume rate of carrier gas (helium) – 1.5 ml/min; stream dividing – 1:2.

Results and discussion. Under the given conditions of HPLC-analysis the retention time for metronidazole is 5.85 min. The spectral ratios relation to λ = 210 nm are determined, and it has been shown that detection at λ = 280 nm or 300 nm is optimal. Limit of detection is 0.3 µg/mL (calculated by the ratio of «signal/noise»).

Under the given conditions of GLC-analysis the retention time for metronidazole is 9.077 min. Limit of detection is 0.1 µg/mL (calculated by the ratio of «signal/noise»).

Conclusions. The conditions of metronidazole detection and identification by the methods of high-performance liquid and gas-liquid chromatography have been experimentally fitted.