

# EXTRACTION OF METRONIDAZOLE FROM AQUEOUS SOLUTIONS

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**Introduction.** The choice of sample preparation procedure for biological liquids exerts key influence on parameters of bioanalytical method. The main stage of sample preparation of biological objects for subsequent determination of the target substances is the analyte extraction from the aqueous medium by organic solvents.

**Aim.** To study the process of metronidazole extraction from aqueous solutions by organic solvents for further development of the sample preparation procedure for blood and urine.

**Materials and methods.** Metronidazole was of pharmacopoeial purity. The metronidazole solutions with concentrations of 20, 40, 80 and 140  $\mu\text{g/mL}$  in water,  $1 \cdot 10^{-2}$  mole/L and  $1 \cdot 10^{-5}$  mole/L hydrochloric acid solutions,  $1 \cdot 10^{-2}$  mole/L and  $1 \cdot 10^{-5}$  mole/L sodium hydroxide solutions were prepared.

*The extraction procedure:* 10.00 mL of metronidazole solution was placed into the separating funnel and extracted with 10.00 mL of chloroform or mixture of chloroform and isopropanol (8:2). The obtained organic extracts were separated, filtered through the paper filter with 1 g of sodium sulphate anhydrous (wetted with the respective solvent) into the measuring flask with the capacity of 25.0 mL, and diluted to the volume with the same solvent. Two aliquots of the obtained solution (in 10.00 mL each) were used for quantitative determination of metronidazole by the method of UV-spectrophotometry. The extract was evaporated and the dry residue was dissolved in 10.00 mL of 0.1 mole/L hydrochloric acid solution or 10.00 mL of 96% ethanol. The absorbance of the obtained solutions was measured at 277 nm or 310 nm respectively using the respective solvent as compensation solution.

All spectrophotometric measurements were carried out using a single beam UV/VIS spectrophotometer SPEKOL®1500 (Analytik Jena AG, Germany).

**Results and discussion.** Metronidazole extraction from aqueous solutions was carried out with organic solvents immiscible with water; the medium pH was equal to  $\approx 2, 5, 7, 9$  and  $12$  that corresponded to the values commonly used to isolate analytes from body liquids in forensic toxicology. To create pH acid and alkali were used instead of buffer solutions to model the real conditions of sample preparation.

**Conclusions.** Metronidazole is extracted from aqueous solution in all types of medium (acid, weak acid, neutral, alkaline and alkaline) with effectiveness not less than 30%. The most effective extragent for metronidazole is the mixture of chloroform and isopropanol (8:2) at pH  $\approx 12$  (97%) and pH  $\approx 9$  (90%).