**6-8 classes.**

**Spectrophotometric determination of various groups of drugs.**

Spectrophotometric determination of cyanocobalamin:

Identification:

1) UV spectrophotometry: 0.002% aqueous solution of the drug has a maximum absorption at wavelengths of 278±1 nm; 361 ± 1 nm and 548 ± 2 nm.

2) The ratio of optical densities (D) is determined at different wavelengths.

$\frac{D при 361 нм}{D при 548 нм}$ the ratio should be within 3.0-3.4;

$\frac{D при 361нм}{D при 278 нм}$ the ratio should be in the range of 1.7-1.88.

Quantitation:

It is carried out by spectrophotometry (given for injection solution).

0.02 mg of cyanocobalamin in 1 ml is diluted with water, the optical density of the resulting solution is measured in a cuvette with a layer thickness of 1 cm on a spectrophotometer at a wavelength of 361 nm. Water is used as a control solution.

The amount of cyanocobalamin in mg (X) in 1 ml of the drug is calculated using the following formula:

$$X=\frac{D∙10∙V\_{1}}{207∙V}$$

Here:

D is the optical density of the test solution;

E\_1cm^(1%)= 207 - specific absorption rate of cyanocobalamin;

V is the volume taken for dilution;

V1 is the final volume of the solution.

Spectrophotometric determination of beta-lactam antibiotics:

Benzylpenicillin procaine salt is quantified by UV spectrophotometry at a wavelength of 290 nm.

Phenoxymethylpenicillin is quantified by UV spectrophotometry at a wavelength of 268 nm.

Oxacillin is quantified by UV spectrophotometry at a wavelength of 235 nm (specific absorbance equal to 34.8).

Cephalosporins are quantified by UV spectrophotometry at a wavelength of 262 nm.

Spectrophotometric determination of riboflavin:

Identification:

UV spectrophotometry: Riboflavin aqueous solution should give 4 absorption maxima at 223, 267, 370 and 445 nm.

Quantitation:

UV spectrophotometry method. 0.06 g (exact weight) of the drug is dissolved in a mixture of 2 ml of glacial acetic acid and 500 ml of water while heating on a water bath in a volumetric flask with a capacity of 1000 ml. The solution is cooled and the volume of the solution is adjusted to the mark with water. Take 10 ml of this solution, place in a volumetric flask with a capacity of 100 ml, add 3.5 ml of 0.1 M sodium acetate solution and bring the volume to the mark with water. The optical density of the resulting solution is measured on a spectrophotometer at a wavelength of 267 nm in a cuvette with a layer thickness of 1 cm. The percentage of riboflavin (x) is calculated by the following formula:

$$x=\frac{D ·10000}{a ·850}$$

Here,

D is the optical density of the test solution;

a - weighed portion of the drug in grams;

850 is the specific absorption value of pure riboflavin at a wavelength of 267 nm.

The drug should contain 98.0-102% riboflavin in terms of dry matter.

Spectrophotometric determination of aminoglycosides.

Purity definition:

The presence of impurities is determined by measuring the optical density (should be no more than 0.3) of 33% sulfuric acid solutions of aminoglycoside antibiotics on a spectrophotometer at a wavelength of 400 nm.

Quantitation:

Kanamycin, gentamicin, amikacin - spectrophotometric method - determine the optical density of the product resulting from the interaction of the antibiotic with acid chromium blue.

Streptomycin quantitative determination is carried out according to the maltol test at a wavelength of 525 nm.