nutrition of plants through the absorption of nutrients. Soil pH is a feature, which the agrochemical properties of soils and plant growth depend on.

Aim. Carrying out the comparative analysis of the main methods of soil acidity determination.

Materials and methods. Comparative analysis.

Results and discussion. Soil pH measurement in Ukraine is now standardized by two regulatory documents: DSTU ISO 10390:2007 "Soil quality. Determination of pH" and DSTU 8346:2015 "Soil quality. Methods for determining the electrical conductivity, pH and dense residue of water extract"; the specialists also use the no longer valid GOST 26483-85 "Soils. Preparation of soil extracts and determination of its pH by the CINAO method" and GOST 26423-85 "Soils. Methods for determining the cation and anion composition of a water extract".

Comparative analysis of regulatory documentation revealed some differences in the methods of pH measurement, especially in sample preparation.

According to DSTU ISO 10390:2007 the sample of the soil to be researched is taken by volume (5 mL), a special spoon should be used for this purpose; the volume of the solvent is 25 mL, the stirring time is 60 minutes, the settling time is not less than 1 hour, but not more than 3 hours, the solvents are water, 1 M KCl solution and 0.01 M $CaCl_2$ solution. The mentioned document is applicable to the analysis of all types of air-dry soil samples.

According to DSTU 8346:2015 it is recommended to take the sample of the soil to be researched by weight (50 g), the volume of the solvent is 250 mL, the shaking time is much shorter – 5 minutes, but the settling time is increased to 5 hours, only water is recommended to use as a solvent. The document applies to all types of soil (of natural and disturbed composition).

GOST 26423-85 had a limited scope – measuring the pH of saline soils. The main parameters of the method: the sample – 30 g, the volume of the solvent – 150 mL, the stirring time – 3 minutes, the settling time – 5 minutes, solvent – water.

The action of GOST 26483-85 extended to all types of soil except carbonate, gypsum and saline ones. The sample mass is 30 g, the volume of the solvent – 75 mL, the stirring time – 3 minutes, without settling, solvent – 1 M KCl solution.

Conclusions. Soil pH determination techniques have some differences in their performance; according to preliminary experimental data they may affect the measurement results, so it is necessary to carry out the complex experiment using standardized soil samples of different types to identify the factors, which shift the result in one or another direction, and to create the unified technique for soil pH measurement for land certification procedures.

DEVELOPMENT OF THE METHODS OF MILNACIPRAN DETECTION AND QUANTITATIVE DETERMINATION SUITABLE FOR THE CHEMICAL-TOXICOLOGICAL ANALYSIS

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Introduction. Milnacipran, (1*R*, 2*S*)-cis-2(aminomethyl)-*N*,*N*-diethyl-1-phenyl-cyclopropanecarboxamide is a monocyclic antidepressant drug relating to the serotonin-norepinephrine reuptake inhibitor (SNRI) group. It is used for the treatment of depressive disorders of moderate severity as well as in the clinical treatment of fibromyalgia. Two cases of acute intoxications caused by milnacipran overdose were reported in the literature. Toxic milnacipran level in blood was of 3.15 mg/l, lethal milnacipran level in blood was in the range of 6–89 mg/l. The most of bioanalytical methods for milnacipran determination are based on using HPLC and GLC.

Aim. To develop sensitive and specific methods for milnacipran detection and quantitative determination using thin layer chromatography (TLC) and UV-spectrophotometry.

Materials and methods. R_f values of milnacipran in ten mobile phases including those which are recommended by The International Association of Forensic Toxicologists for TLC drug screening for four types of chromatographic plates (Sorbfil, Merk, plates manufactured in Estonia with KSKG sorbent, Silufol UV-254,) were determined. The UV-spectrum of milnacipran in methanol was measured over 215–380 nm wavelength range. Stock solution (SS) (2000 μg/ml) and 10 working standard solutions (WSS) (60.0; 200.0; 300.0; 400.0; 600.0; 800.0; 1000.0; 1200.0; 1400.0 and 1500.0 μg/ml) of the drug were prepared.

Results and discussion. Three mobile phases of methanol–25% ammonia (100:1.5) (R_f=0.37±0.04), ethyl acetate–methanol–25% ammonia (85:10:5) (R_f=0.53±0.04) and ethyl acetate–acetone–25% ammonia (50:45:4) (R_f=0.81±0.05) had a low correlation of R_f values (they are given for Sorbfil plates). Absorption maxima were detected at wavelengths of 256±2, 262±2, 267±2 and 272±2 254±2 nm. The calibration curve was described by the following equation: y=0.000640x+0.029 (r=0.9994), LOD and LOQ values were of 16.9 μg/ml and 51.0 μg/ml, respectively. The linearity of the calibration curve was within the range of milnacipran concentrations from 60.0 to 1500 μg/ml.

Conclusions. The developed methods of milnacipran detection and quantitative determination using TLC and UV spectrophotometry are sensitive and selective enough for chemical-toxicological analysis.

RESEARCH OF CHROMATOGRAPHICAL PARAMETERS OF LAMOTRIGINE FOR THE PURPOSES OF CHEMICAL-TOXICOLOGICAL ANALYSIS

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Introduction. According to epidemiological services, more than 40 million people suffer from epilepsy worldwide. This ailment is annually detected in 40-70 people per 100 thousand population, and the incidence rates reach 3%. In Ukraine, there are currently about 100,000 patients diagnosed with epilepsy and 500,000 people with its manifestations.

For the treatment of epilepsy, a wide group of anticonvulsants is used. Lamotrigine is one of the most common medicines in this group of drugs. But, according to the analysis of FDA and patientsville.com websites it has been found that more than 30 countries have reported lethal poisonings with lamotrigine.

Aim The aim of this work is to study the chromatographic parameters of lamotrigine in a thin layer of sorbent for the purposes of chemical toxicological analysis.

Materials and methods. As biological objects, model samples of fresh porcine liver weighing 20 g, which have been used saturated with 10 mg of lamotrigine.

Isolation of lamotrigine from the biological matrix was performed with acetonitrile, acidified with HCL. For this, 20 g of ground pork liver, pre-saturated for 24 h with ethanolic solution of lamotrigine (10 mg), was placed in a flask, added 50 ml of acetonitrile, acidified by 6 M. HCL solution to pH 2.0-2.5, infused for 30 min and filtered. The resulting extract was basified with 30% NaOH to pH = 9 and extracted with chloroform. The resulting extract was evaporated to dryness, dissolved in 10 ml of ethanol and examined.

Studies were performed on chromatographic plates Merck silica gel 60 F_{254} (made in Germany) of dimensions 10 × 10 cm. Before elution of the samples, the chromatographic plates were pre-impregnated with methanol and activated in a drying Cabinet at a temperature of 110-120 ^{0}C for 0.5 h.