

A saturated silver chloride electrode EVL – 1 M3 was used as a reference electrode. EMF measurement were carried out by the I – 130 ionomers with an accuracy of EMF measurement of $\pm 0,5$ mV. For research, solution of magnesium chloride and magnesium sulphate were prepared in the concentration range $10^{-1} - 10^{-5}$ M. For analysis, injection solution of magnesium sulphate (250 mg / ml) were taken, which are manufactured by JSC (Lekhim - Kharkov).

Results and discussion. As a result of the researches, it was found that the electrode function of ISE – EM – Mg – 01 is linear in magnesium chloride solutions in the concentration range $(1,0 \pm 0,2) \cdot 10^{-1} - (1,0 \pm 0,3) \cdot 10^{-4}$ M with a slope of the electrode function of 30 ± 2 mV, with corresponds to the characteristics of the ISE for a doubly charged ion. Then, as the electrode function of this ISE magnesium sulphate is linear in the same concentration range magnesium chloride solutions, however, its slope is 25 ± 3 mV. This indicated a slight decrease in the sensitivity of the ISE in magnesium sulphate solutions, which is due to the extraction of sulphate ions to the phase of the electrode membrane. Therefore, for the analysis of injection solution of magnesium sulphate, it is necessary to use for the preparation of standard solutions magnesium sulphate. For convenience, in the calculations, the concentration of the first (1) standard solutions was $C_1 = 0.001$ g / cm³ of Mg²⁺ ion. The second standard solutions (2) was prepared by ten times dilution of the first standard solutions. The analysis was performed by the narrow-interval two-point calibration graph. To prepare the analyzed solution, 1 cm³ of an injection solution of magnesium sulphate was transferred into a volumetric flask with a capacity of 100 cm³ and dilute to the mark by distilled water and mixed. Then, the EMF of circuit was measured of standard (E_1 and E_2) and the analyzed solutions (E_x).

The concentration of Mg²⁺ (C_x) ion in g / cm³ was calculated by the formula:

$$C_x = C_1 \cdot \text{antilg} \frac{E_x - E_1}{E_1 - E_2}$$

The magnesium sulphate content in mg / ml was calculated by the equation:

$$X = \frac{C_x \cdot M(\text{MgSO}_4) \cdot V_2}{V_1 \cdot M(\text{Mg}^{2+})} \cdot 1000$$

where:

V_1 is the volume of the dosage form taken for dilution, cm³;

V_2 is the total dilution volume, cm³

Conclusions. A method for ionometric analysis of magnesium sulphate in injection solution using an industrial ion-selective film electrode (ISE) - EM - Mg - 01 has been developed. The proposed method is selective, rapid and accurate. The relative standard deviation of the analysis is 2%, which meets the requirements of the scientific and technical documentation for drugs.

COMPARATIVE ANALYSIS OF SOIL pH MEASUREMENT TECHNIQUES

Purykina N. Yu., Ilchenko K. V.

Scientific supervisors: assoc. prof. Zhukova Ya. F.,
assoc. prof. Antonenko O. V., assoc. prof. Klimenko L. Yu.

National University of Pharmacy, Kharkiv, Ukraine

SI "Soils Protection Institute of Ukraine", Kyiv, Ukraine

lina_klimenko@nuph.edu.ua

Introduction. One of the properties of the soil is its fertility, which is the main mean of production in agriculture. An important part of the doctrine of soil fertility is their classification and diagnosis. In turn, determination of soil acidity is one of the most common analyses in the soil diagnostics system. Parameter of acidity or alkalinity of soils has a great influence on the development of roots and

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 CINA 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 CaCl₂ 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

Shamsutdinov Sh., Karpushyna S. A.

Scientific supervisor: prof. Baiurka S. V.

National University of Pharmacy, Kharkiv, Ukraine

svitkrp@gmail.com

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.