between organic cations of studied alkaloids and heteropolyanion $PMo_{12}O_{40}^{3-}$, which leads to the formation of slightly soluble stable compounds of general formula $(Kat)_3PMo_{12}O_{40}$, which are the optimal deposition and weight forms.

Stoichiometric relationship of organic cation: heteropolyanion = 3:1. Gravimetry was performed as follows: to 30ml of filtrate obtained by acid brothing on water bath an excess of 10ml 10^{-2} M solution of MPA was added. The formed deposition has been equilibrating for two hours, then was filtrated through pre-weighed filter "blue ribbon." The deposition was flushed out three times with distilled water, dried in a drying oven at a temperature of 70-80□C. The mass of isolated alkaloids m_{alk} was calculated by the formula:

$$m_{alk} = m \cdot F$$

where,

m – mass of weight form;

F – gravimetrical factor of recalculation.

Gravity confirmed the amperometric titration data, i.e. by method of acid brothing to 2.0% alkaloids can be isolated, depending on the conditions of the isolation process.

The developed methods of gravimetric and amperometric determination of the celandine alkaloids amount using heteropolyanion (HPA) of Kehhin's structure as analytical reagents were adapted to real objects of analysis:

A) Quantification of the alkaloids amount in aqueous-alcoholic extracts of celandine by gravimetric method.

B) Dependence study of % alkaloid content of the celandine vegetation period by amperometric titration.

ISOLATION OF AMOUNTS OF CELANDINE ALKALOIDS BASES (CHELIDONIUM MAJUS L.) BY ELEKTROLYSIS

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The aim of this paper is to develop a universal complex technology of isolation the amount of alkaloids from herbal raw material of celandine as acid extracts and further electrocrystallization of amounts of alkaloids basis with purity grade not less than 98% by electrolysis.

Defined goal is achieved through integrated technology, which consists of two stages:

1) Isolation of celandine alkaloids amount from herbal material using aqueous solutions of mineral acids with weight part of the last 1-3%. Acid steaming up in a water bath for 4 hours provides a concentrated broth (extract) of water-soluble salts of celandine alkaloids amount.

2) Isolation (Electrocrystallization the cathode) of amounts of alkaloids bases in pure form from an aqueous solution of acid broth by electrolysis.

As a result of the consistent implementation of the two stages is an isolation of amount of celandine alkaloids bases from herbal raw materials with full isolation ~ 40-45% with almost no pigments, flavanoids, lipases, which are prerequisite for further purification of alkaloids, isolation. As a result, you can drastically reduce the number of stages in the technological process of obtaining alkaloids, by 7-8 times to reduce the time of alkaloids isolation, completely exclude from the technological process usage of highly toxic and volatile organic solvents, increase the purity and quality of the finished product.

Because of the structural diversity of alkaloids there is no single method of isolating them from natural raw materials. Most methods are based on the use of the fact that the foundations of the alkaloids are usually readily soluble in organic solvents and poorly soluble in water and salt - on the contrary. When allocating alkaloids in the form of salts, herbal material is treated with 1-3% aqueous solution of hydrochloric acid. After this treatment, all alkaloids pass into the acid extract as hydrochloric salts. Water and acid extraction is carried out by heating in a percolators or on water bath. Paying attention on the good solubility as hydrochloric salts *AlkCl* of celandine in water (solubility ~ 325-375 g / l), we can assume that they will dissociate into ions:

$$AlkCl \rightarrow Alk^{+} + Cl^{-}$$

In this the cathode will provide the following electrochemical reactions:

1. Hydrogenisolation reaction by restoring hydronium ions:

$$H_3O^{+} + e \leftrightarrow \frac{1}{2}H_2 + H_2O$$

2. Restoration of water molecules on the reaction:

$$2H_2O + 2e = H_2 + 2OH^{-},$$

that is accompanied by a sharp rise in the current and change in pH of the solution at the cathode (pH - 14). Thus, instead of ions Alk^{+} at the cathode water molecules will recover. In this case the two electrons coming from the cathode react with two molecules of water forming hydrogen molecule and two hydroxyl-ions. Reduced hydrogen is released from solution in the form of gas bubbles. Reduction of H^{+} ions is compensated by migration in katolit of Alk^{+} cations and leaving it with an equivalent amount of Cl^{-} ions. Near the cathode Alk^{+} and OH^{-} ions are accumulated. In this case, the

OH-ions are the end product of the electrochemical reaction and their concentration in the electrode surface and reach some mol / l. In connection with this, the near-electrode layer chemical reaction runs:

$$Alk^{+} + OH^{-} \rightarrow AlkOH \downarrow$$

Thus, alkaloids are deposited on the cathode due to positive adsorption as finely dense residuals amounts of *AlkOH* alkaloids bases of "Chelidonium majus L.".

Based on these experimental data a method of getting celandine alkaloids bases by electrolysis has been developed and phenomenon indifferent electrolyte additive effect on the release rate of alkaloids is thoroughly investigated. Examples of acid extraction fulfilling (steaming up) and electrolysis of salts of alkaloids from herbal material: 50.0 grams of dry and finely dense celandine is poured with 400 ml of 1% aqueous solution of HC1 in heat-resistant chemical flask on 1000ml and steamed up on a water bath within 4-5 hours. Acid broth is filtered through paper filter "red tape", transferred to a flask and diluted to volume of 400 ml. pH of the resulting solution is 3-4.5.100ml of getting acid broth is transferred into electrolyzer with system of electrodes: cathode with area 2000mm^2 made of steel grade; anode with area 2000mm^2, made of aluminum, which is in minicapsule with parchment paper, which provides purity of acid broth from pollution with compounds of aluminum. The distance between the electrodes is 30 mm, the voltage at the electrodes is 2.5 V, the current in the electrolyzer is I=100mA. Electrolysis of acid broth was carried out in four phases of 15 minutes, in general electrolytic isolation of alkaloids occurred during 60 minutes. Crystals of alkaloids basis amount, formed on a steel cathode were washed with d water, ethyl hydroxide and dried in baker at t=50^{0}C.

The influence of various factors on the extent of isolation of celandine alkaloids amount is studied. The degree of alkaloids isolation is mostly affected by temperature increase and introduction of additives, the final product of transformation on the electrode in which is OH^- ions and the equilibrium potential of which is more negative than equilibrium potential for restoration of water molecules.