NEW METHODS OF CARRYING OUT THE COLOUR REACTIONS ACCORDING TO THE REQUIREMENTS OF THE GREENING

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To determine the concentration of substances and elements inorganic polymeric materials (sorbents, immobilized with organic reagents [1, 2]) are used. For analytical purposes opaque film sorbents are widely used. We have proposed using an optically transparent material based on cellulose and photogelatine as the solid matrix. It is a particularly clean preparation [3]. Materials of the kind are called indicated sensitive elements and have been here used to determine calcium and heavy metals in liquids using the method of spectrophotometry and visually. Transparent sensitive elements with immobilized forms of reagents are more effective than solutions for the purposes of analytical chemistry (high sensitivity, selectivity, expressivity and simplicity of detection) and ecological chemistry (clean production, easy utilization, mass character, multielement analysis and low cost of analyses). All the above-listed features taken together meet the demands of green technology in the field of disease diagnostics and ecological chemical monitoring.

A new organic reagent has been chosen to determine calcium ions in a solution, namely arsenazo III. The formation of the sensitive layer of the pink-coloured reagent occurs spontaneously mainly due to electrostatic interactions. The thickness of this layer of the reagent has been checked spectrophotometrically. A salient feature of this sensitive element is its high selective ability to calcium ions (the maximal length of the complex absorption wave is 605 nm), which is possible due to the analytical properties of the chemical reagent itself and conditions of calcium determination. The limit of detection is $3 \cdot 10^{-2}$ mg/L.

Thus a method of the sensitive indicated materials synthesis of a brand-new type has been worked out, conditions of determination found and data of the abundance of calcium ions in the water of the Yauza-river (the Rubtsovskaya Embankment) during the snow-melting period obtained.

The abundance of Ca^{2+} in early March 2007 exceeded 1000 mg/L, the medium level of the spring period does not outstrip 400 mg/L.

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