стоимость, выбрано с учетом максимально возможной экологичности данных процессов. Также очищенные сточные воды могут использоваться для питьевого водоснабжения близлежащих населенных пунктов.

Для мелкой добычи была предложена нетрадиционная схема с использованием рукавных фильтров и торфа, как ионообменного агента.

Преимущества торфа:

- на территории северо-западной части Украины есть большие его залежи;
- отходы очистки воды полностью экологичны и могут использоваться в промышленности;
- согласно проведенных в процессе работы исследований торф позволяет снизить солесодержание на 30 - 80%.

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PHOTOMETRIC DETERMINATION OF PHOSPHATE-IONS CONCENTRATION BY ZIRCONIUM-ARSENAZO I COMPLEX

Increasing of nutrients (nitrogen, phosphorus) level in natural waters is the reason of eutrophication [1]. It results in hypoxia of water bodies, water poisoning by algae toxins, death of the fish and other aquatic organisms. Fields runoff (leaching of fertilizers from soils) and ineffectively treated wastewater are the main sources of nutrients. A lot of water softeners and washing powders contain phosphates. Thus, new method of simple, quick and effective determination of phosphates in samples of water, soils and detergents is very important.

Principe of determination was based on reaction of Arsenazo I and zirconium-ions with formation stable violet complex and high stability of zirconium phosphate. Presence of phosphate-ions changed purple colour of complex to the salmon colour of free Arsenazo I, as a result of the complex destruction, binding ions Zirconium and release of Arsenazo I. That is, the overall Arsenazo I-Zr had purple, that turns to a salmon colour of free Arsenazo I in the presence phosphate-ions, as a result of the destruction system, binding of zirconium-ions and release of Arsenazo I.

For experiments we selected solutions of Arsenazo I with concentration 0.6 mM and $ZrOCl_2$ with concentration 0.2 mM. 1 mL of Arsenazo I solution, 2 mL of 0.1 M HCl solution and different volumes of zirconium-containing solution were placed in a volumetric flasks (50 mL) and diluted to 50 mL by distilled water.

Different Arsenazo I:Zr ratios were discovered. At the ratio 1:1 on the spectrum maximum at 500 nm disappeared and new maximum (540 nm) became the main (Figure 1). With increasing of Zr content intensity of colour change was reduced. So, proportion in the middle of range (1.5:1-3:1) could be effective for obtaining of calibration graphs.

Decreasing of Zr content led to increasing of method sensitivity but also to diminishing of phosphate determination range. Therefore for analysis of materials with low concentration of phosphates it was better to use indication system with significantly imbalanced ratio like 6:1-4:1, but in cases of high phosphate concentration 2:1-1:1 would be better.

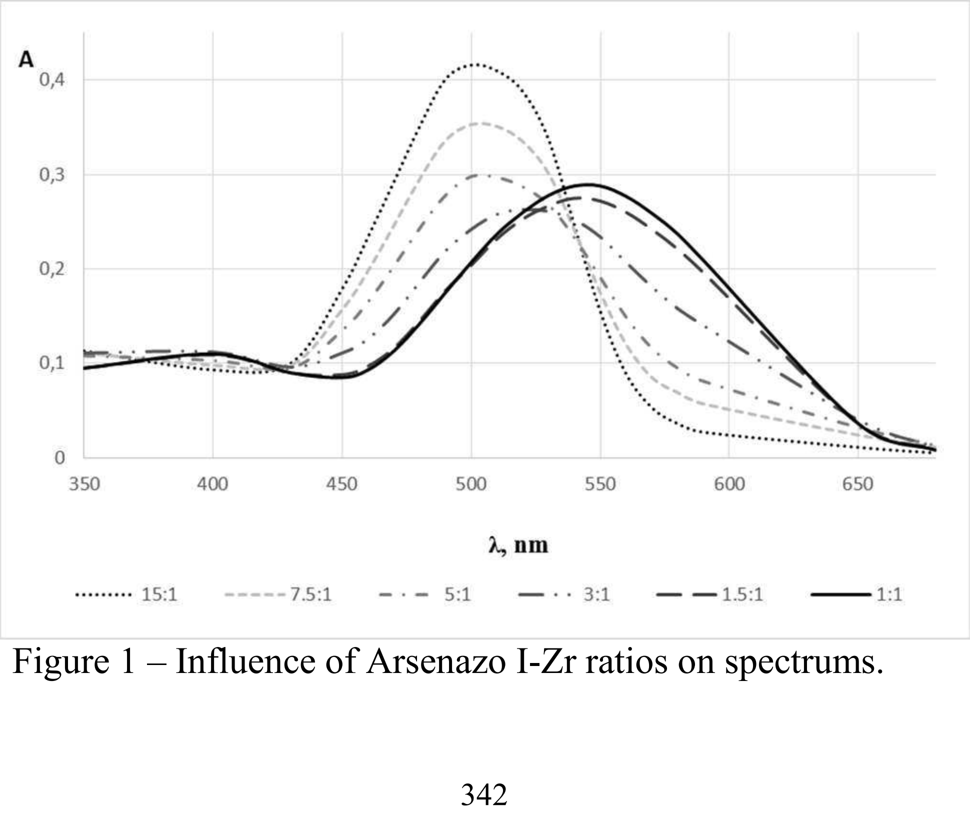

Figure 1 – Influence of Arsenazo I-Zr ratios on spectrums.

Sensitivity could be varied not only by ratio, but also by concentration of components.

For simplification of usage it was possible to apply complex Arsenazo I-Zr on materials like silica gel, aerosil and thin-layered silicon plates. These materials could adsorb Arsenazo I-Zr complex and became light violet. But for higher colour intensity silica materials could be modificated by quaternary ammonium salt. It made possible the chemisorption of Arsenazo I-Zr on the surface of silicon-containing substances due to reaction between ammonium-groups of modificated material and sulfo-groups of Arsenazo I.

Thus, novel method of phosphate determination is effective, simple, quick and useful for phosphate indication in the samples of water, washing powders (after dissolving) and soils (in acid extract).

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ПОЛУЧЕНИЕ НОВЫХ ОРГАНИЧЕСКИХ ЛИГАНДОВ НА ОСНОВЕ ИНДОЛИНОВЫХ СПИРОПИРАНОВ ПЕРСПЕКТИВНЫХ ПРИ УПРАВЛЕНИИ ВЫНУЖДЕННОЙ ФЛУОРЕСЦЕНЦИЕЙ КВАНТОВЫХ ТОЧЕК

Создание гибридных материалов, объединяющих в себе неорганическую наночастицу и фотохромные лиганды открывает значительные перспективы для контроля вынужденной