Please translate the following paragraphs in problems 1, 2, and 3 into Chinese.

1. Analytical methods have been developed for the detection and quantitation of a new herbicide active ingredient, aminocyclopyrachlor, and its analogue aminocyclopyrachlor methyl in environmental samples. The analytes were purified from soil extracts and water samples using solid phase extraction based on mixed-mode cation exchange/reverse phase retention. Analyte identification and quantitative analyses were performed by high performance liquid chromatography coupled to tandem mass spectrometry by an electrospray ionization source. External standards prepared in neat solvents were used for quantitation, providing acceptable accuracy, with no matrix effects observed during method validation. The method limits of quantitation (LOQ) were 0.10 ng/mL (ppb, parts-per-billion) in water and 1.0 ng/g in soil for both compounds. The limit of detection (LOD) in water was estimated to be 20 ng/L (ppt, parts-per-trillion) for aminocyclopyrachlor and 1 ng/L for aminocyclopyrachlor methyl, while LODs in soil were 100 ng/kg and 10 ng/kg for aminocyclopyrachlor and aminocyclopyrachlor methyl, respectively. **(25 points)**

2. A modified extraction procedure was applied to extract arsenic from investigated plants before speciation analysis. Sonication (60 min) with 10 mL of water was applied as the first step of arsenic extraction from plant samples. After the first step of the extraction procedure samples were centrifuged, supernatant was decanted and 10 mL of 4% SDS was added to the residue. The next step of extraction procedure was 4 h shaking with SDS solution. After the second step of sequential extraction samples were centrifuged and supernatant was diluted 10 times. Arsenic was determined by ICP-MS after chromatographic separation of arsenic species. The total arsenic concentrations in extracts used for arsenic speciation analysis was measured by ICP-MS. Arsenic speciation analysis by HPLC-ICP-MS was carried out for both water and SDS fractions. The sequential extraction was applied for 5 samples: roots, rhizomes, petioles and fronds of Lady Fern and leaves of Reed Grass. Concentrations of arsenic species in plant organs are given in Table 2. The extraction efficiency for the applied sequence extraction and recovery are given in Table 3. Selected chromatograms are presented in Fig. 4 and Fig. 5. **(25 points)**

3. Emulsions are dispersions of one liquid into the second immiscible liquid in the form of fine droplets. Emulsions can be classified as either oil-in-water or water-in-oil emulsions depending on whether oil or water is the dispersed phase. Milk, cream and sauces are some examples of oil-in-water emulsions whereas butter and margarine are examples of water-in-oil emulsions. Ice cream and fabricated meat products are complex oil-in-water emulsions in which either additional solid particles are present or the continuous phase is semi-solid or a gel. Formation of emulsion results in a large interfacial area between two immiscible phases and therefore is usually associated with an increase in free energy. Consequently, emulsions are thermodynamically unstable, i.e., they will phase separate eventually. However, emulsifiers and proteins are usually employed in the formulation. They adsorb at the liquid-liquid interface thus lowering the interfacial tension. Smaller interfacial tension helps in the dispersion of one phase in the form of fine droplets by lowering the required interfacial energy. In addition, the emulsifiers and proteins also modify the interdroplet forces thereby either preventing or retarding the rate of coalescence of colliding droplets during emulsion formation. Modification of interdroplet forces also helps in prolonging shelf life (kinetic stability) by slowing the rate of coarsening of emulsion drop size due to coalescence during storage. Proteins and emulsifiers also help in the extension of shelf life by providing rheological properties to the liquid-liquid interface. **(25 points)**

見背面

Please transform the following procedures in problem 4 into a flowchart in Chinese that can be easily followed during the practice.

4. Determination of the sugars in sugar cane juice using the phenol-sulfuric acid assay

Materials

(1) 4% phenol: 40 g phenol (reagent grade) in 1 liter distilled water, store up to 6 months at room temperature
(2) 96% sulfuric acid (reagent grade)
(3) 1 mg/mL sugar standards (reagent grade) stored in sealed tubes
(4) Sample: **Sugar cane juice (the major carbohydrate was sucrose, a disaccharide of glucose and fructose)**

Procedures

1. Wash the 10-ml test tubes with distilled water. Set the spectrophotometer at 490 nm. Allow the lamp of the spectrophotometer to warm up and zero the instrument with a blank solution of 500 mL 4% phenol and 2.5 mL of 96% sulfuric acid.

2a. *For samples containing a single sugar unit (monosaccharides or simple polysaccharides):*
Prepare calibration sugar standards using 1 mg/mL sugar standard solutions, of the same sugar present in the test sample, in distilled water. Transfer aliquots to 10 different, dry 10 mL tubes in 5 μL increments ranging from 5 to 50 μL, with an accurate pipet.

2b. *For samples containing different sugar units (monosaccharide mixtures or complex polysaccharides):* Mix stoichiometric amounts of all of the component sugar units present in the sample and prepare a 1 mg/mL (total) solution in distilled water. Prepare calibration sugar standards by transferring aliquots to 10 different 10 mL tubes in 5 μL increments from 5 to 50 μL with an accurate pipet.

3. Transfer a portion of the sample to be analyzed to a 10 mL test tube.
4. To all the tubes, add 500 μL of 4% phenol followed by 2.5 mL 96% sulfuric acid.
5. Transfer the solutions from the test tubes to the cuvettes and measure the A_{490} of the sugar standards and unknown solutions.
6. To calculate the concentration of sugar present in the sample, make a graph plotting A_{490} versus sugar weight (μg) of the sugar calibration standards.
7. Calculate the unknown sample concentration using the following equations:

$$\text{concentration (mol/g)} = \frac{x\text{(g)}}{\text{Mol. wt (g/mol)} \times \text{weight (g)}}$$

$$\text{percentage of sugar (\% by weight)} = \frac{x\text{(g)}}{\text{weight (g)}} \times 100$$

where x is the mass (g) of sugar sample deduced from the graph, mol. wt. represents the molecular weight of the monosaccharide or polysaccharide in the sample, and w is the weight (g) of the sample (step 3). **(25 points)**

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