Zespół Szkół Chemicznych in Włocławek

Developing vocational education concepts for the professional fields of action

"Working in the chemistry laboratory" and "environmental engineer"

Tasks for the field of "Environmental Engineers"

ULO1: 6. Determination of calcium in a soil sample

You are an employee in a laboratory at the Center for Agricultural Consultancy, which analyzed the soil on the usefulness of the agricultural objectives. Your task is the quantitative and qualitative determination of the content of calcium ions in the soil. As a method for the processing of the task is the management of the Centre for Agricultural Consultancy titrating. Please follow the rules and enter the percent content of calcium in the soil.

Procedural knowledge Characterization of the work activity		**Factual knowledge** Characterization of the working system	
Work steps	**Skills / abilities**	**scientific contexts**	**technological contexts**
Task: Detection of potassium ions in the soil - please find an appropriate	- Analysis of the task - Organization of the workplace - Activity Planning	- Knowledge of the influence of potassium ions on the quantity and quality of herbal products	

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method - organization of work: glass apparatus and reagent for analysis	- Can perform corresponding calculations	- Knowledge of the influence of calcium ions on the correct development of the plants - Knows the principles of the quantitative and qualitative analysis - Knows the classification of ions in analytical groups	
Preparation: • Preparation of soil sample for the qualitative determination, to 1g dried soil sample Weigh on Crystal • 5 ml of HCl, c = 0.1 mol / dm3 thereto pipette • Preparation of soil sample for the quantitative determination, to 5 g of dried soil sample to Crystal • 20 ml of HCl, c = 0.1 mol / dm3 pipette to mix and 20 mL dist. Give water and 2 drops of phenolphthalein to • Preparation of the reagent:	• Dealing with the laboratory techniques • handling chemicals (H & P-phrases) • Precise and careful work • Preparation of soil sample for analysis • Preparation of Solutions	• Calculations • material knowledge	• Scale • Laboratory dryer

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• NaOH, c = 0.1 mol / dm3 • HCL, c = 0.1 mol / dm3			
Conduct: • Qualitative determination of calcium in the soil • Quantitative determination of calcium in the soil	• Dealing with the laboratory techniques • handling chemicals (H & P-phrases) • Precise and careful work • Application of knowledge for titration	• Accurate diagnosing (reading) by criteria • Analogue display of the consumed volume of NaOH to the buret	• Scale • Watch glass • Pipettes • Burette • Erlenmeyer flask
Evaluation: Protocol for qualitative and quantitative determination	• calculations • logging • Specifying the content of calcium in percent		
Experimental setup, cleaning	-	-	-

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