

Identification of Unknown Anion

Objective

Using “Borderless Lab 365”, to determine the unknown anion.

Introduction

- Qualitative analysis is the process of identifying the compound.
- Unlike quantitative analysis finding the quantity of a specific material, qualitative analysis simply determines the presence or absence of certain materials.
- Different tests should be performed to identify the unknown ions.
- In this experiment, we mainly focus on identifying the anions.

Theory

Anion in a mixture may precipitate in the presence of a specific cation, while other anions will not. By this method, we will be able to identify the unknown anion.

Solubility Rules

	NO_3^-	Cl^-	SO_4^-	CO_3^{2-}
NH_4^+	Soluble	Soluble	Soluble	Insoluble
Na^+				
K^+				
Ca^{2+}		Insoluble		
Ba^{2+}				
Pb^{2+}		Soluble		
Ag^+				

One of the applications for qualitative analysis is screen test. For example, it can be used to test the purity of Chinese medicine. Some unethical businessmen might add aluminum to Chinese medicine to increase the mass. By using qualitative analysis, the impurity can be checked quickly at low cost.

Apparatus

- “Borderless Lab 365” Platform
- Unknown Solution
- Silver Nitrate
- Calcium Nitrate

Procedure

1. Log in the experiment module “Identification of Unknown Anion” on the Borderless Lab 365 platform. <https://stem-ap.polyu.edu.hk/remotelab/>
2. Wash the glass tube by pressing “WASH”. (Note: you can wash the glass tube 4 times only throughout the session.)
3. Add 2mL of unknown solution.
4. Add 2mL of silver nitrate to the 2mL of unknown sample.
5. Observe the test tube and record the result.
6. Repeat step 2 to step 5 with calcium nitrate.
7. Wash the glass tube again at the end of experiment, and then press “LOGOUT” on the left.

Experimental Data

Observation when known solution added to unknown mixture

Calcium Nitrate	Silver Nitrate

Discussion

1. What can we deduce after adding silver nitrate? Explain?
2. What can we deduce after adding calcium nitrate to the mixture? Explain?
3. How can we deduce that carbonate ion is present or not in the mixture?
4. What is the anion(s) present in the mixture?
5. Write the ionic equation for the reaction.

Reference

Confirmatory Tests. (2020, August 16). Retrieved July 26, 2021, from <https://chem.libretexts.org/@go/page/97257>