Gravimetric Analysis

Spoken Tutorial Project
http://spoken-tutorial.org
National Mission on Education through ICT
http://sakshat.ac.in

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Learning Objectives

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- **The concentration of arsenic in unknown samples of contaminated water**

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We will determine,

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- **The mass percent of arsenic in the samples**

System Requirement

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- **Ubuntu Linux v18.04**

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- **ChemCollective Vlabs v2.1.0**

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- **Java v11.0.8**

Pre-requisites

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- **ChemCollective Vlabs interface**

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- **For the prerequisite tutorials, please visit this website**
  www.spoken-tutorial.org

Gravimetric Analysis

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- **This method works for a solution where either of the ions present can be precipitated**

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- **Gravimetric analysis relies on stoichiometry**

Steps involved in Gravimetric Analysis

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- **Write the relevant equation for the analysis**

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- **Find the stoichiometry of precipitated compound to the original salt in the soluble form**

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- **Find the mass of salt in grams from moles of salt**
  Grams of salt = moles of the salt $\times$ Mol wt of the salt
- **Determine the mass percent of the salt**

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$$Na_3AsO_4(aq) + 3AgNO_3(aq) \rightarrow Ag_3AsO_4(s) + 3NaNO_3(aq)$$

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$$AsO_4^{-3}(aq) + 3Ag^{+}(aq) \rightarrow Ag_3AsO_4(s) \downarrow$$

Stoichiometry

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- **Grams of Arsenic in 1 Kg of soil =**
  $0.0008 \times 74.921 = 0.0599 gms$

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- **Grams of Arsenic in 1 Kg of soil =**
  $0.0008 \times 74.921 = 0.0599 gms$
- **Mass % of Arsenic in Sample 1 =** $0.0599 \times \frac{100}{1000}$
  = 0.00599 gms (59.9 mcg)

Calculation Table

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Sample	Wt of Ag_3AsO_4 ppt (grams)	Moles of Ag_3AsO_4	grams of As in 1Kg of soil	Mass % of Arsenic
Sample 1	0.37	0.0008	0.0599	0.00599

Calculation Table

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Sample	Wt of Ag_3AsO_4 ppt (grams)	Moles of Ag_3AsO_4	grams of As in 1Kg of soil	Mass % of Arsenic
Sample 2	0.231	0.0005	0.0374	0.00374

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We have determined,

- **The concentration of arsenic in unknown samples of contaminated water**
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Using gravimetric analysis,

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1. **Design an experiment to find the amount of salt present in a bag of chips**

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1. **Design an experiment to find the amount of salt present in a bag of chips**
2. **Hint:**

$$NaCl(aq) + AgNO_3(aq) \rightarrow AgCl(s) + NaNO_3(aq)$$

About the Spoken Tutorial Project

- **Watch the video available at http://spoken-tutorial.org /What_is_a_Spoken_Tutorial**
- **It summarises the Spoken Tutorial project**
- **If you do not have good bandwidth, you can download and watch it**

Spoken Tutorial Workshops

The Spoken Tutorial Project Team

- **Conducts workshops using spoken tutorials**
- **Gives certificates to those who pass an online test**
- **For more details, please write to contact@spoken-tutorial.org**

Forum for specific questions

- **Questions in THIS Spoken Tutorial?**
- **Visit https://forums.spoken-tutorial.org**
- **Choose the minute and second where you have the question**
- **Explain your question briefly**
- **The Spoken Tutorial project will ensure an answer**

You will have to register to ask questions

Acknowledgements

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