

Effect of Temperature on Solubility

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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We will learn,



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We will learn,

- ▶ **About solubility of salts with temperature**



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- ▶ **Check if solubility is exothermic or endothermic**



Learning Objectives

We will learn,

- ▶ **About solubility of salts with temperature**
- ▶ **Check if solubility is exothermic or endothermic**
- ▶ **Study the relationship between solubility and heat transfer**



Pre-requisites



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- ▶ **ChemCollective Vlabs interface**



Pre-requisites

- ▶ ChemCollective Vlabs interface
- ▶ If not for relevant tutorials please visit our website
www.spoken-tutorial.org



System Requirement



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- ▶ Mac OS v 10.10.5



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- ▶ **ChemCollective Vlabs v 2.1.0**



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- ▶ **Java v 8**



Solubility



Solubility

- Note that solubility of $\text{Ce}_2(\text{SO}_4)_3$ is much lower than KCl



Results



Results

- ▶ For KCl , solubility increases with increase in temperature



Results

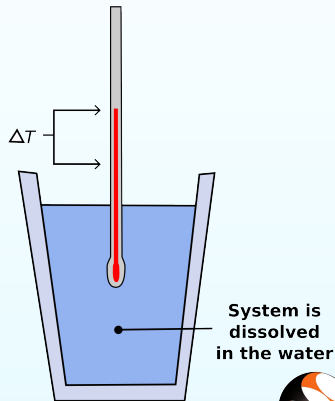
- ▶ For KCl , solubility increases with increase in temperature
- ▶ For $Ce_2(SO_4)_3$, solubility decreases with increase in temperature



Styrofoam cup

- * Foam cup acts as Calorimeter for measurements made at constant pressure
- * Heat exchange does not happen easily as it is a better insulator than glass

Styrofoam cup



Results



Results

Salt	Initial Temp	Temp after dissolution	Reaction	Solubility with increase in Temp
KCl (5 g)	25° C	21° C	Endothermic	Increases
Ce ₂ (SO ₄) ₃ (2 g)	25° C	27° C	Exothermic	decreases



Summary



Summary

We have,

- ▶ **Determined the solubilities of KCl & $Ce_2(SO_4)_3$ with increase in temperature**
- ▶ **Observed that solubility of, KCl is endothermic**
- ▶ **Solubility of $Ce_2(SO_4)_3$ is exothermic**



Assignment 1



Assignment 1

1. **List some examples of exothermic and endothermic processes in your daily lives**



Assignment 1

1. **List some examples of exothermic and endothermic processes in your daily lives**
2. **Explain why heat is absorbed or evolved during a reaction**



Assignment 2



Assignment 2

1. Determine whether dissolution of NaCl is exothermic or endothermic
(Hint: The problems are under solubility topic in load homework window)



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

- ▶ Do you have questions in **THIS Spoken Tutorial?**
- ▶ Please visit
<http://forums.spoken-tutorial.org>
- ▶ Choose the minute and second where you have the question
- ▶ Explain your question briefly
- ▶ Someone from our team will answer them



Acknowledgements

- ▶ **Spoken Tutorial Project is a part of the Talk to a Teacher project**
- ▶ **It is supported by the National Mission on Education through ICT, MHRD, Government of India**
- ▶ **More information on this Mission is available at**

<http://spoken-tutorial.org /NMEICT-Intro>

