

Chemistry 101 Laboratory

Fall 2005 - 2006

Lecture 10

Identifying the Mystery Metal

Purpose

- To conduct some tests, that are accompanied by a visual change, on few **common metal ions**.
- To identify unknown metal ions.

Theoretical Background

Metal ions can be easily identified; most metal ions undergo characteristic reactions with certain solutions. Such reactions include production of a gas, color change, or formation of a precipitate (visual change).

Experiment Overview

- conduct some tests with few **common metal ions** to see what colored precipitates they form with **three solutions**.
- make a chart of these reactions for easy reference.
- identify a “mystery” metal ion by treating it and comparing the results with the chart.

Experiment

- ***Metal ions used:*** Al^{3+} , Cu^{2+} , Fe^{2+} , Fe^{3+} , Pb^{2+} and Ag^{+} .

Use available solutions of soluble compounds that contain the above ions.

- ***Reagents needed:***

Ammonium sulfide, $(\text{NH}_4)_2\text{S}$

Ammonium carbonate, $(\text{NH}_4)_2\text{CO}_3$

Potassium iodide, KI

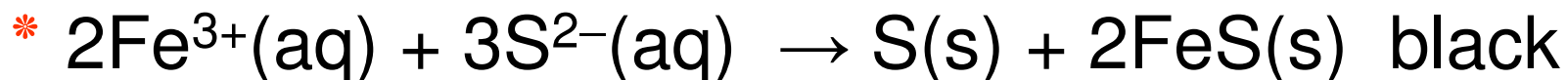
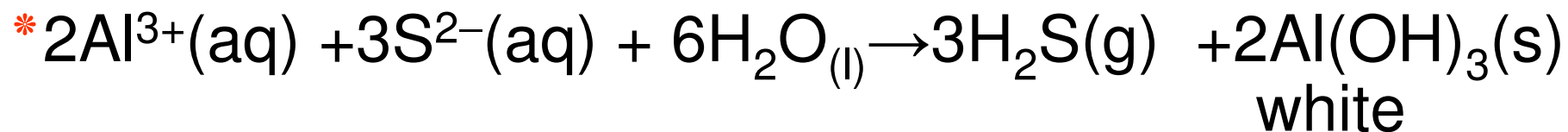
- Test each of the **metal ions** with each of the **three reagents** and record your observations. Write the corresponding chemical reactions.

Use a spot plate and run the reactions according to the following chart

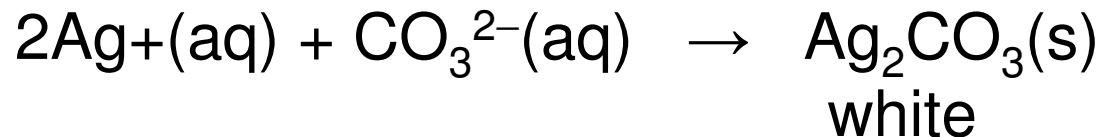
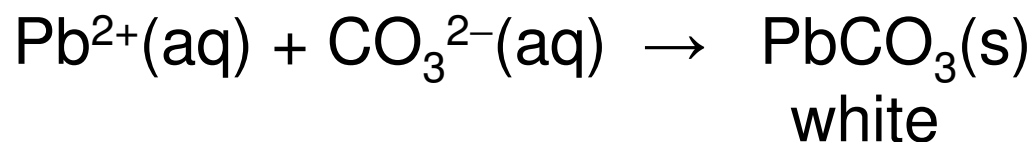
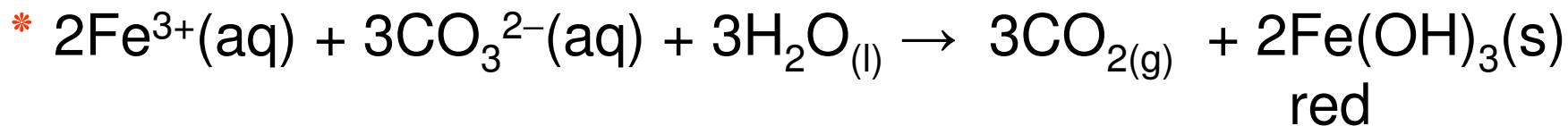
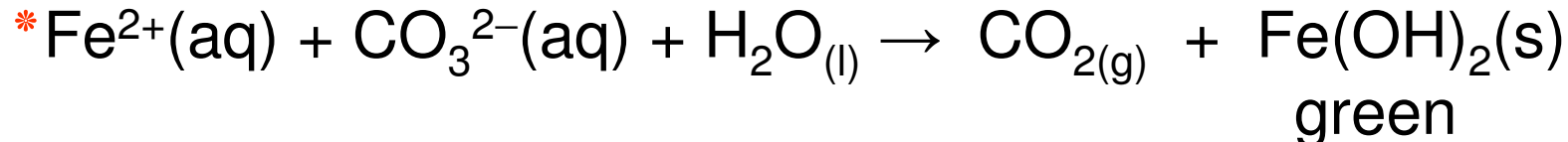
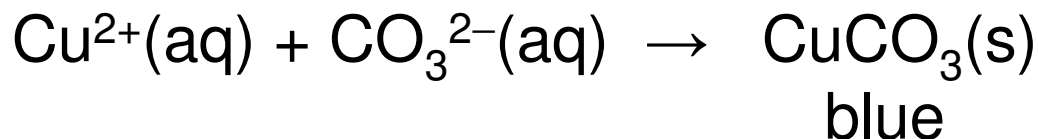
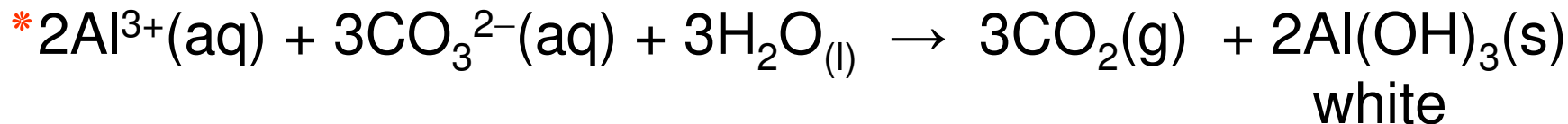
	Ammonium Sulfide (S) ⁻²	Ammonium carbonate (CO ₃) ⁻²	Potassium Iodide (I ⁻)
Aluminum (Al ³⁺)			
Copper (II) (Cu ²⁺)	CuS		
Iron (II) (Fe ²⁺)		Fe(OH) ₂	
Iron (III) (Fe ³⁺)			
Lead (Pb ²⁺)			PbI ₂
Silver (Ag ⁺)			

Reactions Involved

a- Reactions with Ammonium Sulfide



b- Reactions with Ammonium Carbonate



c- Reactions with Potassium Iodide

