

THE EFFECT OF TEMPERATURE ON AN EQUILIBRIUM SYSTEM

LAB EQL.1

The Caliper, Vernier Software & Technology.

PURPOSE

The purpose of this lab is to study the effect of temperature on a well-known Cobalt Chloride equilibrium system and to detect and explain any change in conductance.

MATERIALS

Cobalt Chloride Hexahydrate (s) 1g	Ehtanol (95%) 170 ml
Erlenmeyer flask 250 ml	Vernier Temp probe
Vernier conductivity probe	Vernier lab pro
Computer with Logger Pro 3.3	Two 600 ml beakers
Ice	Hot plate
Rubber band	Distilled water
Balance	

PROCEDURE

1. Attach the temperature probe to channel one and the conductivity probe to channel two of the lab pro and tape the handles of the probes together.
2. Set the conductivity probe to 0-600 μ S/cm range.
3. Attach the lab Pro to the computer and start up the Logger Pro program.
4. Set up a data-collection rate of 6 readings/minute for 10-15 minutes.
5. Dissolve 1g of solid Cobalt Chloride in 170ml of ethanol in a 250ml Erlenmeyer flask.
6. Slowly add distilled water until the color changes.
7. Place probes in flask with solution.
8. Start collection and collect data for 1 minute at room temperature.
9. Place the flask in the hot water bath (70c).
10. Collect data for 5 minutes.
11. Transfer the flask to the cold-water bath. (with ice, ~5c).
12. Collect data for 5 minutes (total of 12 to 15 minutes).

DATA ANALYSIS

1. Write the complete and balanced equation for this reaction.

2. Write the net ionic equation for this reaction.

The Effect of Temperature on an Equilibrium System

3. What color changes, if any, did you observe? Can you explain what caused these changes?

4. Is this reaction endothermic or exothermic?

5. What change did you observe in conductivity and why?

6. If a printer is available, print and attach the graphs you developed.

*It is theoretically possible to do the lab with a T183+ silver calculator or a Palm handheld.
Due to the nature of the graphs used the computer is probably preferred.