Solubility of Salts

SCH3U | Student laboratory assignment | 1 of 4

Prepare for your investigation

Name: _____ Date: _____ Class: _____

Research question

How does temperature affect the solubility of different ionic compounds, and how can solubility curves predict crystallization?

Learning goal: use the virtual model to gather evidence, explain solubility of salts and communicate a supported conclusion.

Materials: WorksheetGalaxy virtual laboratory, this assignment, calculator or spreadsheet if needed. Virtual observations only; do not recreate hazardous procedures or perform physical fitness tests without teacher approval.

1. Define two relevant scientific terms from the Background Information tab. (K/U)

2. Write a prediction or hypothesis with a scientific reason. (K/U, T/I)

3. Identify the variable or feature compared, the measured outcome and constants or consistent observation criteria. (T/I)

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Perform the virtual laboratory

Open the corresponding virtual lab and read Background Information. Follow the investigation instructions below. Record authentic simulated results; do not invent data.

Investigation A — Solubility curves

Select KNO_3 and set water mass to 100 g.

• At 10, 20, 30, 40, 50, 60, 70 and 80 °C, add sufficient solute to determine the saturation limit. Record each trial.

• Repeat with NaCl using the same temperature range.

• Compare the shapes and slopes of the two curves.

Investigation B — Cooling and crystallization

• Prepare a saturated KNO_3 solution at 70 °C using 100 g water.

• Cool to 20 °C using the Cool to control. Record how much solid crystallizes.

• Repeat with NaCl and compare the crystallized masses.

• Use the calculated solubility values to predict the crystallized mass before checking the simulation.

Record each completed observation using the simulator’s record control when available. Use Data & Graphs to review results. Export CSV if available; attach additional rows or screenshots when needed.

Record the exact settings and any changes to the method.

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Observations & results

Enter the actual results. Keep trial IDs consistent between continued tables. Attach the full exported data or extra sheets when the procedure requires more rows. Include units as displayed.

Data table 1

Trial / item	Salt	Temp (°C)	Water (g)	Added (g)	Solubility (g/100 g)

Data table 1 — continued (2)

Trial / item	Dissolved (g)	Undissolved (g)	Crystallized (g)

Qualitative observations / sample calculation (show units where applicable)

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Analysis, conclusion & assessment

4. Present a labelled graph of a measured relationship, or an annotated diagram / comparison chart for qualitative investigations. Attach it separately. Explain the pattern using recorded evidence. (C, T/I)

5. Compare two contrasting observations from your investigation of Solubility of Salts. Explain the difference using the background information. (K/U, A)

6. Use a specific recorded result to answer the research question. Explain the scientific reasoning behind it. (K/U, A)

Conclusion and evaluation: answer the research question, revisit the prediction using evidence, identify a model limitation and propose an improvement. (T/I, A)

Submit this assignment plus your completed Lab Report (printed or saved as PDF from the lab) and any supporting data/figures.

K/U: accurate concepts /10	T/I: method, data, reasoning /12	C: clear tables, units, report /8	A: explanation, conclusion, transfer /10

Total: /40