Organic Properties & Ester Synthesis

SCH4C | Student laboratory assignment | 1 of 4

Prepare for your investigation

Name: _____ Date: _____ Class: _____

Research question

How can observations from this virtual investigation explain organic properties & ester synthesis?

Learning goal: use the virtual model to gather evidence, explain organic properties & ester synthesis 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.

• Predict which of the four reference compounds are likely to mix with water and explain why.

• Use the Properties mode to examine each compound. Record observations in the data table.

• Switch to Ester synthesis . Select an acid and alcohol; predict the ester name.

• Compare simulated runs with and without a catalyst and at two temperatures. Keep the reaction time constant when comparing.

• Record at least three synthesis trials, interpret the graph, and complete the lab report.

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	Investigation	Sample / reaction	Conditions	Observation / model output

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. How does the functional group affect mixing with water? (K/U, A)

6. Explain the difference between increasing reaction rate and changing equilibrium yield. (K/U, A)

7. Identify two limitations of this simulation and propose a safer way to verify ester formation in a real laboratory. (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