Combustion Reactions & Formation of Oxides

SCH3U | Student laboratory assignment | 1 of 4

Prepare for your investigation

Name: _____ Date: _____ Class: _____

Research question

How does oxygen availability influence the products of hydrocarbon combustion, and how do metal and nonmetal oxides differ in their reactions with water?

Learning goal: use the virtual model to gather evidence, explain combustion reactions & formation of oxides 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)

Combustion Reactions & Formation of Oxides

SCH3U | Student laboratory assignment | 2 of 4

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.

Part A — Combustion

Select methane, propane, or ethanol as fuel.

• Run a complete-combustion condition and an oxygen-limited condition for the same fuel.

• Record the balanced equations, predicted products, visible observations, and oxygen demand.

• Compare at least two fuels and explain why incomplete combustion is a safety concern.

Part B — Oxides

• Select magnesium oxide, calcium oxide, or carbon dioxide.

• Simulate adding the oxide to water and testing pH.

• Record the reaction or equilibrium, expected pH category, and interpretation.

• Explain why oxide classification is a useful generalization rather than a universal rule.

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.

Combustion Reactions & Formation of Oxides

SCH3U | Student laboratory assignment | 3 of 4

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	Condition	Predicted products / observation	Equation

Qualitative observations / sample calculation (show units where applicable)

Combustion Reactions & Formation of Oxides

SCH3U | Student laboratory assignment | 4 of 4

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. Analysis: oxygen availability, products and safety (K/U, A)

6. Analysis: oxide classification and pH (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