

Grade 9 Chemistry Final Exam

Cumulative Units 1–9: models, matter, atoms, reactions, and gases

75 minutes. Calculator permitted. Show reasoning and units. All data are fictional paper models.
Total 30 points.

1. Which is an inference? [1 pts]

- A. Balance reads 5.0 g
- B. Liquid is blue
- C. A reaction occurred
- D. Bubbles appeared

2. Calculate density of 18.0 g in 6.0 mL. [2 pts]

3. For ${}_{17}^{35}\text{Cl}^{-}$, state protons, neutrons, electrons. [3 pts]

4. Draw a simple periodic-trend arrow for atomic radius down a group and explain with shells/shielding. [3 pts]

5. Write formula for aluminum oxide and explain charge balance. [2 pts]

6. Balance $\text{C}_3\text{H}_8 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$. [2 pts]

7. Use $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$. With 0.60 mol H_2 and excess O_2 , predict water moles. [2 pts]

8. A gas has $V_1 = 2.00$ L at 300 K and is heated to 450 K at constant pressure. Calculate V_2 . [3 pts]

9. A concentration-versus-time graph is steep then shallow. State rate trend and one collision-model explanation. [3 pts]

10. A sealed vessel changes 12.50 g to 12.49 g on ± 0.02 g uncertainty. State supported claim, overclaim, and one further measurement that would strengthen the comparison. [3 pts]

11. A particle diagram shows dots spread farther apart after heating. State one supported model claim, one limitation, and one observation the diagram cannot determine. [3 pts]

12. Extended CER: a fictional material recovers more mass after a separation method than a comparison. Make bounded claim, cite evidence, explain a particle/model connection, and name a limitation or next measurement. [3 pts]
