

These questions are multiple-choice questions that ask you to select only **one** answer choice from a list of four choices. Each correct answer gives you one point.

CHEMISTRY

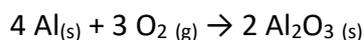
31. The electrons with principle energy level $n = 2$ of a stable atom of boron (atomic number = 5) would have an electron arrangement of:

- A. $[\][\uparrow][\uparrow][\uparrow]$
- B. $[\][\uparrow\downarrow][\uparrow][\]$
- C. $[\uparrow][\uparrow][\uparrow][\]$
- D. $[\uparrow\downarrow][\uparrow][\][\]$

32. In group 18, He (helium) is unique because:

- A. it does not have an octet configuration in its ground state
- B. it has a higher reactivity than the other noble gases
- C. it forms a stable salt containing the $[\text{He}_3]^+$ ion
- D. it has an extremely high melting point

33. The value of ΔH^0 for the following reaction is -3352 kJ:



The value of ΔH_f^0 for $\text{Al}_2\text{O}_{3(s)}$ is:

- A. -3352 kJ
- B. -1676 kJ
- C. $+3352$ kJ
- D. -16.43 kJ

34. What is the empirical formula for an oxide of nitrogen which is found to contain 63.2% oxygen by mass? ($M_N = 14$ g/mol, $M_O = 16$ g/mol)

- A. N_2O
- B. N_2O_3
- C. NO_2
- D. N_2O_5

35. A piece of stone has a mass of 24.595 grams and a volume of 5.34 cm^3 . What is the density of the stone? Pay attention to the number of significant figures and precision of your calculation!

- A. 0.217 cm^3/g
- B. 4.61 g/cm^3
- C. 0.22 cm^3/g
- D. 4.606 g/cm^3

36. Uranium isotopes have different
- A. atomic numbers
 - B. atomic masses
 - C. numbers of protons
 - D. numbers of electrons
37. The total number of electrons allowed in a $l = 1$ sublevel is:
- A. 2 electrons
 - B. 6 electrons
 - C. 8 electrons
 - D. 14 electrons
38. How many unshared pairs of electrons does water have?
- A. one
 - B. two
 - C. three
 - D. four
39. In the reaction, $\text{CO}_{(g)} + \text{NO}_{2(g)} \rightleftharpoons \text{CO}_{2(g)} + \text{NO}_{(g)}$, which of the following changes would result in the formation of more products at equilibrium?
- A. increasing the pressure of the reaction mixture
 - B. removing $\text{CO}_{(g)}$ from the reaction mixture
 - C. adding $\text{NO}_{2(g)}$ to the reaction mixture
 - D. adding $\text{CO}_{2(g)}$ to the reaction mixture
40. How many mL of water must be added to 450 mL of 0.8 M glucose to dilute the solution to 0.4 M?
- A. 900 mL
 - B. 600 mL
 - C. 300 mL
 - D. 450 mL