

Name:

Chapter 5 Review Quiz

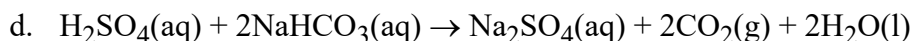
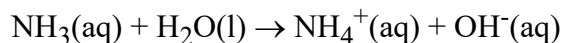
Multiple Choice

Identify the choice that best completes the statement or answers the question.

- ☐ 1. A metal reacts spontaneously with hydrochloric acid. What are the general products of the reaction?
- salt, carbon dioxide, water
 - carbon dioxide, water
 - salt, water
 - salt, hydrogen gas
- ☐ 2. Which of the following is NOT an acid?
- HF
 - NH₃
 - CH₃COOH
 - H₂SO₄
- ☐ 3. Which of the following is NOT a property of bases?
- soapy feel in aqueous solution
 - conduct electricity in solution
 - sour taste
 - turn red litmus blue
- ☐ 4. Which of the following represents the correct ionic equation for zinc + sulfuric acid?
- $\text{Zn(s)} + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + 2\text{H}^+$
 - $\text{Zn(s)} + 2\text{H}^+ + \text{SO}_4^{2-} \rightarrow \text{ZnSO}_4 + \text{H}_2(\text{g})$
 - $\text{Zn(s)} + 2\text{H}^+ + \text{SO}_4^{2-} \rightarrow \text{Zn}^{2+} + \text{SO}_4^{2-} + \text{H}_2(\text{g})$
 - $\text{Zn(s)} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$
- ☐ 5. A base can produce:
- hydrogen ions in solution.
 - hydronium ions in solution.
 - hydroxide ions in solution.
 - oxide ions in solution.
- ☐ 6. A student has spilt some clear colourless acid on the floor. Which of the following would not neutralise the acid?
- adding water
 - adding a base
 - adding solid sodium carbonate
 - adding an alkali
- ☐ 7. When hydrochloric acid is reacted with magnesium oxide it forms the same products as when HCl reacts with magnesium hydroxide. What can you conclude?
- HCl is so reactive that it produces the same products with a range of substances.
 - Magnesium oxide is soluble.
 - Magnesium oxide and magnesium hydroxide are the same substance.
 - Magnesium oxide is a basic oxide.
- ☐ 8. A substance that can act as an acid or a base is known as:
- amphoteric.
 - amphiprotic.
 - an oxide.

d. none of the above.

- ▼ 9. Neutralisation is the name given to a reaction between:
- an acid and metal.
 - an acid and base.
 - an acid and water.
 - a base and water.
- ▼ 10. Which of the following gives all the products of a reaction between an acid and a carbonate?
- a salt and hydrogen
 - a salt and water and hydrogen.
 - a salt and carbon dioxide
 - a salt and water and carbon dioxide
- ▼ 11. For the reaction $\text{HNO}_3(\text{aq}) + \text{KOH}(\text{aq}) \rightarrow \text{KNO}_3(\text{aq}) + \text{H}_2\text{O}(\text{l})$ $\Delta H = 56 \text{ kJ mol}^{-1}$
If 20 mL of $0.15 \text{ mol L}^{-1} \text{HNO}_3$ solution reacts with 10 mL of $0.25 \text{ mol L}^{-1} \text{KOH}$ solution in a thermally insulated container, how much heat energy is produced?
- 0.028 kJ
 - 0.14 kJ
 - 0.224 kJ
 - 0.56 kJ
- ▼ 12. 200 mL of $2 \text{ mol L}^{-1} \text{HCl}$ solution is mixed with 200 mL of $2 \text{ mol L}^{-1} \text{NaOH}$ solution in a thermally insulated container. If the initial temperature of the solutions is 20°C and the amount of energy released in the reaction is 21 kJ, what is the final temperature of the solution?
- 21°C
 - 33°C
 - 45°C
 - 66°C
- ▼ 13. Which of the following processes does NOT involve the application of a neutralisation reaction?
- using an antacid to relieve indigestion
 - cleaning up an acid spill
 - using tea leaves to produce blue hydrangea flowers
 - adding quicklime to mine wastewater
- ▼ 14. The first scientist to propose that hydrogen was the key component that gave an acid its properties was:
- Lavoisier.
 - Davy.
 - Arrhenius.
 - Lewis.
- ▼ 15. A Brønsted–Lowry base:
- accepts a proton.
 - includes more bases than previous definitions.
 - accepts hydrogen ions.
 - all of the above.
- ▼ 16. What is a product of reacting hydrochloric acid and ammonia gas?
- hydrogen gas
 - ammonia chloride
 - ammonium chloride
 - water
- ▼ 17. Which of the following reactions is not correct?
- $\text{NaOH}(\text{aq}) + \text{NH}_4\text{Cl}(\text{aq}) \rightarrow \text{NaCl}(\text{aq}) + \text{NH}_4\text{OH}(\text{aq})$
 - $\text{HCl}(\text{aq}) + \text{MgO}(\text{s}) \rightarrow \text{MgCl}_2(\text{aq}) + \text{H}_2\text{O}(\text{l})$
 -



- ▼ 18. Which of the following statements regarding Brønsted–Lowry theory of acids and bases is incorrect?
- a. An acid is a proton donor.
 - b. A base is a proton acceptor.
 - c. Substances cannot be defined as acid or base if no hydrogen is present.
 - d. The type of solvent is unimportant.
- ▼ 19. The Lewis definition of an acid and base is broader than the Brønsted–Lowry definition because:
- a. it does not require a proton.
 - b. it does not require a solvent.
 - c. it considers electron pair acceptance and donation.
 - d. all of the above.
- ▼ 20. Water is amphoteric because it can:
- a. produce both H^+ and OH^- ions.
 - b. accept or donate a H^+ .
 - c. dissolve both acids and bases.
 - d. it can form H_3O^+ .

