


Name:**Score:** 0 / 20 points (0%)

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?
- a. salt, carbon dioxide, water
 - b. carbon dioxide, water
 - c. salt, water
 - d. salt, hydrogen gas


ANSWER: D

The general reaction between an acid and metal is: acid + metal → salt + hydrogen gas.

POINTS: 0 / 1

FEEDBACK:

REF: 127

-  2. Which of the following is NOT an acid?
- a. HF
 - b. NH₃
 - c. CH₃COOH
 - d. H₂SO₄


ANSWER: B

NH₃ is ammonia, which is a base.

POINTS: 0 / 1

FEEDBACK:

REF: 119

-  3. Which of the following is NOT a property of bases?
- a. soapy feel in aqueous solution
 - b. conduct electricity in solution
 - c. sour taste
 - d. turn red litmus blue


ANSWER: C

Bases have a bitter taste while acids have a sour taste.

POINTS: 0 / 1

FEEDBACK:

REF: 122

-  4. Which of the following represents the correct ionic equation for zinc + sulfuric acid?
- a. $\text{Zn(s)} + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + 2\text{H}^+$
 - b. $\text{Zn(s)} + 2\text{H}^+ + \text{SO}_4^{2-} \rightarrow \text{ZnSO}_4 + \text{H}_2(\text{g})$
 - c. $\text{Zn(s)} + 2\text{H}^+ + \text{SO}_4^{2-} \rightarrow \text{Zn}^{2+} + \text{SO}_4^{2-} + \text{H}_2(\text{g})$
 - d. $\text{Zn(s)} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$

ANSWER: C

The products of the reaction are a salt and hydrogen gas. The ionic equation shows species as ions where relevant.

POINTS: 0 / 1

FEEDBACK:

REF: 124



5. A base can produce:

- a. hydrogen ions in solution.
- b. hydronium ions in solution.
- c. hydroxide ions in solution.
- d. oxide ions in solution.

ANSWER: C

A base contains the oxide or hydroxide ions and produces hydroxide ions in solution.

POINTS: 0 / 1

FEEDBACK:

REF: 124



6. A student has spilt some clear colourless acid on the floor. Which of the following would not neutralise the acid?

- a. adding water
- b. adding a base
- c. adding solid sodium carbonate
- d. adding an alkali

ANSWER: A

An acid is neutralised by a base. Sodium carbonate and alkali are basic; water would dilute the acid but not neutralise it.

POINTS: 0 / 1

FEEDBACK:

REF: 1258



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?

- a. HCl is so reactive that it produces the same products with a range of substances.
- b. Magnesium oxide is soluble.
- c. Magnesium oxide and magnesium hydroxide are the same substance.
- d. Magnesium oxide is a basic oxide.

ANSWER: D

Acids react with hydroxides and basic oxides to produce a salt and water.

POINTS: 0 / 1

FEEDBACK:

REF: 126



8. A substance that can act as an acid or a base is known as:

- a. amphoteric.
- b. amphiprotic.
- c. an oxide.
- d. none of the above.


ANSWER: A

Some oxides are acidic while other are basic; however, some may act as both and acid and base so are amphoteric.

POINTS: 0 / 1

FEEDBACK:

REF: 124

-  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.


ANSWER: B

Neutralisation is the reaction between an acid and base to produce a salt and water.

POINTS: 0 / 1

FEEDBACK:

REF: 125

-  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


ANSWER: D

The general equation for the reaction between an acid and a carbonate is acid + carbonate \rightarrow salt + water + carbon dioxide.

POINTS: 0 / 1

FEEDBACK:

REF: 126

-  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 mol L^{-1} HNO_3 solution reacts with 10 mL of 0.25 mol L^{-1} 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

ANSWER: B


KOH is the limiting reagent so $n_{\text{KOH}} = n_{\text{H}_2\text{O}} = 2.5 \times 10^{-3} \text{ mol}$.

Therefore, $\Delta H = 2.5 \times 10^{-3} \times 56 \text{ kJ}$

POINTS: 0 / 1

FEEDBACK:

REF: 128

-  12. 200 mL of 2 mol L^{-1} HCl solution is mixed with 200 mL of 2 mol L^{-1} 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


ANSWER: B

The final temperature is calculated using $q = mc\Delta T$.

POINTS: 0 / 1

FEEDBACK:

REF: 128

-  13. Which of the following processes does NOT involve the application of a neutralisation

reaction?

- a. using an antacid to relieve indigestion
- b. cleaning up an acid spill
- c. using tea leaves to produce blue hydrangea flowers
- d. adding quicklime to mine wastewater


ANSWER: C

Tea contains tannic acid so adding tea makes the soil acidic not neutral.

POINTS: 0 / 1

FEEDBACK:

REF: 133

-  14. The first scientist to propose that hydrogen was the key component that gave an acid its properties was:
- a. Lavoisier.
 - b. Davy.
 - c. Arrhenius.
 - d. Lewis.


ANSWER: B

Humphry Davy showed HCl and H₂S had acidic properties so proposed hydrogen not oxygen was responsible for acidic properties.

POINTS: 0 / 1

FEEDBACK:

REF: 135

-  15. A Brønsted–Lowry base:
- a. accepts a proton.
 - b. includes more bases than previous definitions.
 - c. accepts hydrogen ions.
 - d. all of the above.


ANSWER: D

All the statements are true of the Brønsted–Lowry definition of a base

POINTS: 0 / 1

FEEDBACK:

REF: 137–8

-  16. What is a product of reacting hydrochloric acid and ammonia gas?
- a. hydrogen gas
 - b. ammonia chloride
 - c. ammonium chloride
 - d. water


ANSWER: C

Ammonia is a weak base that produces OH[−] ions when it reacts with water. However, a reaction of ammonia gas with HCl produces ammonium chloride.

POINTS: 0 / 1

FEEDBACK:

REF: 136

-  17. Which of the following reactions is not correct?
- a. $\text{NaOH(aq)} + \text{NH}_4\text{Cl(aq)} \rightarrow \text{NaCl(aq)} + \text{NH}_4\text{OH(aq)}$
 - b. $\text{HCl(aq)} + \text{MgO(s)} \rightarrow \text{MgCl}_2\text{(aq)} + \text{H}_2\text{O(l)}$
 - c. $\text{NH}_3\text{(aq)} + \text{H}_2\text{O(l)} \rightarrow \text{NH}_4^+\text{(aq)} + \text{OH}^-\text{(aq)}$
 - d. $\text{H}_2\text{SO}_4\text{(aq)} + 2\text{NaHCO}_3\text{(aq)} \rightarrow \text{Na}_2\text{SO}_4\text{(aq)} + 2\text{CO}_2\text{(g)} + 2\text{H}_2\text{O(l)}$


ANSWER: A

The reaction between sodium hydroxide and ammonium chloride produces sodium chloride, ammonia gas and water.

POINTS: 0 / 1

FEEDBACK:

REF: 137

-  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.


ANSWER: D

Brønsted–Lowry theory requires a solvent that has a hydrogen attached to an oxygen or nitrogen.

POINTS: 0 / 1

FEEDBACK:

REF: 137–8

-  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.


ANSWER: D

All the statements about Lewis definition are correct.

POINTS: 0 / 1

FEEDBACK:

REF: 138–9

-  20. Water is amphiprotic 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^+ .

ANSWER: B

An amphiprotic substance can both accept and donate a proton.

POINTS: 0 / 1

FEEDBACK:

REF: 138

