

## Assessment

## Chapter 10

## BLM 10-7

## Chapter 10 Test

## Goal

Assess your understanding of the concepts you studied in Chapter 10.

## What To Do

Choose the best answer from each of the following choices given.

- Which of the following are an acid-conjugate base pair?
 

(a) $\text{AgNO}_3$ and $\text{KNO}_3$	(b) $\text{H}_3\text{PO}_4$ and $\text{H}_2\text{PO}_4^-$
(c) $\text{H}_2\text{CO}_3$ and $(\text{NH}_4)_2\text{CO}_3$	(d) $\text{NaOH}$ and $\text{Na}^+$
- Which of the following is not an Arrhenius base, but is a Bronsted-Lowry base?
 

(a) $\text{NaOH}$	(b) $\text{CH}_3\text{COOH}$
(c) $\text{NH}_3$	(d) $\text{Ca}(\text{OH})_2$
- What are the spectator ions in the reaction
 
$$2 \text{K}^+_{(\text{aq})} + 2 \text{OH}^-_{(\text{aq})} + 2 \text{H}^+_{(\text{aq})} + \text{SO}_4^{2-}_{(\text{aq})} \rightarrow \text{K}_2\text{SO}_{4(\text{aq})} + 2 \text{H}_2\text{O}_{(\ell)}$$

(a) $\text{K}^+_{(\text{aq})} + \text{SO}_4^{2-}_{(\text{aq})}$	(b) $\text{H}^+_{(\text{aq})} + \text{SO}_4^{2-}_{(\text{aq})}$
(c) $\text{H}^+_{(\text{aq})} + \text{OH}^-_{(\text{aq})}$	(d) $\text{K}^+_{(\text{aq})} + \text{OH}^-_{(\text{aq})}$
- Which of the following is true?
 

(a) Brønsted-Lowry bases behave differently in water than Arrhenius bases.
(b) Brønsted-Lowry acids behave differently in water than Arrhenius acids.
(c) The Brønsted-Lowry theory requires the presence of water for its explanation of acid-base phenomenon, while Arrhenius does not.
(d) The Arrhenius theory requires the presence of water for its explanation of phenomenon, while the Brønsted-Lowry does not.

For questions 5–14 predict whether each of the following is:

**A.** acidic      **B.** basic      **C.** molecular      **D.** an ionic salt

- |                            |                              |
|----------------------------|------------------------------|
| 5. $\text{PbSO}_4$         | 10. $\text{CH}_4$            |
| 6. $\text{H}_2\text{CO}_3$ | 11. $\text{H}_3\text{PO}_4$  |
| 7. $\text{HNO}_3$          | 12. $\text{Ba}(\text{OH})_2$ |
| 8. $\text{KOH}$            | 13. $\text{CO}_2$            |
| 9. $\text{H}_2\text{S}$    | 14. $\text{CaCl}_2$          |
15. A conjugate base:
- Is much stronger than the acid that produced it.
  - Can be used for titrations.
  - Is the result of an acid losing a proton.
  - Is the result of a strong base reacting.

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16. A strong acid:
- (a) will dissociate better if the room is colder
  - (b) will dissociate better if a catalyst is added
  - (c) will dissociate 100% under most conditions
  - (d) will dissociate better if a strong base is present than if a weak base is present
17. If an acid and a base react:
- (a) there will always be a conjugate acid and a conjugate base as products
  - (b) there will always be spectator ions
  - (c) water is not usually formed
  - (d) a precipitate usually forms
18. Which of the following substances will dissociate 100%?
- (a)  $\text{H}_2\text{S}$             (b)  $\text{CH}_3\text{OH}$         (c)  $\text{CH}_3\text{COOH}$     (d)  $\text{HF}$
19. What is the final pH when 35 mL of 0.200 mol/L sulfuric acid are titrated with 18 mL of 0.030 mol/L sodium hydroxide?
- (a) 1.87            (b) 0.59            (c) 2.19            (d) 0.91
20. Table salt is formed by the reaction of:
- (a) sulfuric acid and lime            (b) nitric acid and baking soda
- (c) hydrochloric acid and lye        (d) none of these
21. Phenolphthalein:
- (a) is used in milk to create a strawberry colour
  - (b) will turn blue if the solution is acidic enough
  - (c) turns from clear to pink in a solution that has lime added to it
  - (d) is an indicator that conveniently is coated on to strips of paper to test acids and bases
22. If an acid is spilled in the laboratory, what should be done?
- (a) pour a strong base on the acid immediately
  - (b) dilute the spill with water, then wipe it up with paper towels
  - (c) wipe the acid up using specialized towels only
  - (d) pour baking soda on the acid spill or spray the fire extinguisher at it

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23. Which part of the meniscus should you read while titrating?
- (a) read the bottom of the meniscus, after waiting for the liquid to settle
  - (b) read the bottom of the meniscus, as soon as possible when you realize the endpoint has changed in the flask
  - (c) it is best to average the top and bottom of the meniscus to get the most accurate reading
  - (d) the top of the meniscus is the most consistent place to read
24. How can you prevent drops clinging to the pipette?
- (a) add a small amount of salt to all solutions you wish to pipette
  - (b) add a small amount of acid to all solutions you wish to pipette
  - (c) shake the pipette the same way each time
  - (d) touch the pipette to the inside of the reaction flask
25. The resulting pH when 2.0 L of water to be added to dilute 2.0 L of 0.50 mol/L HCl is:
- (a) 0.66
  - (b) 6.0
  - (c) 0.6
  - (d) 0.60
26. Which of the following elements is *not* involved in hydrogen bonding?
- (a) N
  - (b) Cl
  - (c) F
  - (d) O
27. Which of the following is neither an acid nor a base?
- (a)  $\text{H}_2\text{CO}_3$
  - (b)  $\text{CH}_3\text{OH}$
  - (c)  $\text{Be}(\text{OH})_2$
  - (d)  $\text{NH}_4\text{OH}$
28. 9.53 g of  $\text{Mg}(\text{OH})_2$  are dissolved in 1.00 L of solution. 10.66 g of which of the following acids are needed to neutralize the solution?
- (a) HCl
  - (b) HI
  - (c)  $\text{H}_2\text{CO}_3$
  - (d)  $\text{H}_3\text{PO}_4$
29. Which of the following is *not* polyprotic?
- (a) HCl
  - (b)  $\text{H}_2\text{S}$
  - (c)  $\text{H}_3\text{PO}_4$
  - (d)  $\text{H}_2\text{SO}_4$
30. In a titration, 90 mL of 1.8 M hydrochloric acid required 80 mL of calcium hydroxide solution for complete neutralization. The concentration of the sodium hydroxide solution was:
- (a) 2.0 mol/L
  - (b) 0.50 mol/L
  - (c) 1.01 mol/L
  - (d) 1.0 mol/L