

## Solutions Practice Test

Select the best answer.

- 1) A substance whose water solution conducts a current is a(n)
  - a) nonelectrolyte.
  - b) electrolyte.
  - c) nonpolar substance.
  - d) solute.
  
- 2) To conduct electricity, a solution must contain
  - a) nonpolar molecules.
  - b) polar molecules.
  - c) ions.
  - d) free electrons.
  
- 3) Which of the following is an electrolyte?
  - a) sodium chloride
  - b) sugar
  - c) water
  - d) glass
  
- 4) A substance whose water solution does NOT conduct a current is a(n)
  - a) polar substance.
  - b) nonelectrolyte.
  - c) electrolyte.
  - d) ionic substance.
  
- 5) Which of the following is a molecular substance whose water solution conducts electricity?
  - a) liquid hydrogen
  - b) hydrogen chloride
  - c) sugar
  - d) iron
  
- 6) Which of the following is a nonelectrolyte?
  - a) sodium chloride
  - b) hydrogen chloride
  - c) sugar
  - d) potassium chloride
  
- 7) Molecules whose water solutions conduct current
  - a) require carbon to decompose in water.
  - b) ionize in water.
  - c) do not dissolve in water.
  - d) can crystallize.
  
- 8) Carbon dioxide in water is an example of which solute-solvent combination?
  - a) gas-liquid
  - b) liquid-gas
  - c) liquid-liquid
  - d) cannot be determined

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- 9) Sugar in water is an example of which solute-solvent combination?
- a) gas-liquid                      b) liquid-liquid  
c) solid-liquid                     d) liquid-solid
- 10) Oxygen in nitrogen is an example of which solute-solvent combination?
- a) gas-liquid                      b) liquid-gas  
c) gas-solid                        d) gas-gas
- 11) Which of the following decreases the average speed of solvent molecules?
- a) increasing the temperature    b) stirring the solution  
c) adding more solvent            d) decreasing the temperature
- 12) Stirring increases the rate of dissolution because it
- a) raises the temperature.        b) lowers the temperature.  
c) brings fresh solvent into      d) decreases surface area of  
contact with the solute.         the solute.
- 13) Raising solvent temperature causes solvent-solute collisions to become
- a) less frequent and more        b) more frequent and more  
energetic.                            energetic.  
c) less frequent and less         d) more frequent and less  
energetic.                            energetic.
- 14) In the expression *like dissolves like*, the word *like* refers to similarity in molecular
- a) mass.                              b) size.  
c) energy.                            d) polarity.
- 15) The rule *like dissolves like* is used to predict
- a) solubility.                        b) equilibrium.  
c) reactivity.                        d) phase.
- 16) What is the molarity of a solution that contains 0.202 mol KCl in 7.98 L solution?
- a) 0.0132 M                        b) 0.0253 M  
c) 0.459 M                         d) 1.363 M

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- 17) What is the molarity of a solution that contains 125 g NaCl in 4.00 L solution?
- a) 0.535 M                      b) 2.14 M  
c) 8.56 M                        d) 31.3 M

**Solve the following problems. Show your answer and your work.**

- 18) A solution contains 85.0 g of  $\text{NaNO}_3$ , and has a volume of 750. mL. Find the molarity of the solution.

**Select the best answer.**

- 19) How many moles of HCl are present in 0.70 L of a 0.33 M HCl solution?
- a) 0.23 mol                      b) 0.28 mol  
c) 0.38 mol                      d) 0.47 mol

**Solve the following problems. Show your answer and your work.**

- 20) How many grams of NaOH are required to prepare 200. mL of a 0.450 M solution?

**Select the best answer.**

- 21) An NaOH solution contains 1.90 mol of NaOH, and its concentration is 0.555 M. What is its volume?
- a) 0.623 L                      b) 0.911 L  
c) 1.05 L                        d) 3.42 L



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### ANSWER KEY

1) b

2) c

3) a

4) b

5) b

6) c

7) b

8) a

9) c

10) d

11) d

12) c

13) b

14) d

15) a

16) b

17) a

$$18) \frac{85.0 \text{ g NaNO}_3}{750. \text{ mL}} \times \frac{1 \text{ mol NaNO}_3}{85.0 \text{ g NaNO}_3} \times \frac{1000 \text{ mL}}{1 \text{ L}} = 1.33 \text{ M NaNO}_3$$

1.33 M NaNO<sub>3</sub>

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### ANSWER KEY

19) a

$$20) \quad 200. \text{ mL} \times \frac{1 \text{ L}}{1000 \text{ mL}} \times \frac{0.450 \text{ mol NaOH}}{1 \text{ L}} \times \frac{40.00 \text{ g NaOH}}{1 \text{ mol NaOH}} = 3.60 \text{ g NaOH}$$

3.60 g NaOH

21) d

22) a

23) d

24) c

25) c

26) b