

Chem!stry

Name: ()

Class:

Date: / /

Assignment on Acids, Bases and Salts #5

- Write your answers in the spaces below:

1.		2.		3.		4.		5.	
6.		7.		8.		9.		10.	
11.		12.		13.		14.		15.	
16.		17.		18.		19.		20.	

- Which of the following statements must be true for **all** acids in aqueous solution?
 - Their pH value is less than 7.
 - They completely ionise to produce hydrogen ions.
 - They react with any metal to produce hydrogen gas.
 - Dibasic acids are stronger than monobasic acids.

A I only
B I and III only
C I, II and IV only
D I, II, III and IV
- Which of the following pairs of substances cannot react with each other?

A Limewater with aqueous ammonium sulfate.
B Dilute nitric acid with calcium hydrogencarbonate.
C Aqueous sodium hydroxide with zinc oxide.
D Aqueous potassium chloride with magnesium oxide.
- An accident occurred in a school chemistry laboratory and some nitric acid was spilled. Which substance, when added in excess, will neutralise the acid without leaving behind an alkaline solution?

A Aqueous ammonia.
B Calcium carbonate.
C Sodium hydroxide.
D Water.

4. In which reaction is hydrochloric acid **not** behaving as an acid?
- A $\text{HCl}(\text{aq}) + \text{AgNO}_3(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{HNO}_3(\text{aq})$
- B $2\text{HCl}(\text{aq}) + \text{CaCO}_3(\text{s}) \rightarrow \text{CaCl}_2(\text{aq}) + \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g})$
- C $2\text{HCl}(\text{aq}) + \text{CuO}(\text{s}) \rightarrow \text{CuCl}_2(\text{aq}) + \text{H}_2\text{O}(\text{l})$
- D $2\text{HCl}(\text{aq}) + \text{Fe}(\text{s}) \rightarrow \text{FeCl}_2(\text{aq}) + \text{H}_2(\text{g})$
5. Which of the following statements about aqueous calcium hydroxide are true?
- I It conducts electricity.
- II It turns Universal Indicator red.
- III It liberates ammonia gas when heated with an ammonium salt.
- IV It liberates carbon dioxide from aqueous sodium carbonate.
- A I and II only
- B I and III only
- C III and IV only
- D I, II and III only
6. Which of the following is a neutralization reaction?
- A $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{l})$
- B $\text{KCl}(\text{aq}) + \text{AgNO}_3(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{KNO}_3(\text{aq})$
- C $\text{KOH}(\text{aq}) + \text{HCl}(\text{aq}) \rightarrow \text{KCl}(\text{aq}) + \text{H}_2\text{O}(\text{l})$
- D $\text{K}_2\text{CO}_3(\text{aq}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{K}_2\text{SO}_4(\text{aq}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$
7. Which of the following gases, when bubbled into water, will produce a solution with a pH greater than 7?
- A Ammonia
- B Carbon monoxide
- C Chlorine
- D Hydrogen
8. Which two substances react to produce a salt and water only?
- I magnesium and hydrochloric acid
- II magnesium carbonate and hydrochloric acid
- III magnesium hydroxide and hydrochloric acid
- IV magnesium oxide and hydrochloric acid
- A I and II only
- B I and III only
- C II and IV only
- D III and IV only

9. Which statement does not describe a property of a weak acid in solution?
- A It forms a salt with sodium hydroxide.
 - B It has a pH of between 8 and 9.
 - C It only partially ionises to form hydrogen ions when dissolved in water.
 - D It reacts with sodium carbonate to produce carbon dioxide gas.
10. Citric acid, ethanoic acid, hydrochloric acid and sulfuric acid each ionise when dissolved in water to produce hydrogen ions.
- If Universal Indicator is placed in aqueous solutions of each acid, all of which are the same concentration, which solution will produce a colour indicating the lowest pH?
- A Citric acid
 - B Ethanoic acid
 - C Hydrochloric acid
 - D Sulfuric acid
11. Which of the following chemicals can be added to dilute hydrochloric acid to prepare copper(II) chloride?
- A Copper metal
 - B Copper(II) nitrate
 - C Copper(II) sulfate
 - D Copper(II) carbonate
12. What is the most suitable method to prepare a pure sample of zinc chloride?
- A Add zinc carbonate to excess hydrochloric acid.
 - B Add zinc metal in excess to hydrochloric acid.
 - C Add aqueous zinc nitrate to aqueous sodium chloride.
 - D Titrate zinc hydroxide with hydrochloric acid.
13. To prepare a sample of hydrated copper(II) sulfate crystals, Jane thought of this procedure.
1. Add copper(II) hydroxide in excess to sulfuric acid.
 2. Filter to remove excess solids.
 3. Heat the filtrate to dryness to obtain the crystals.
- What is the error in her procedure?
- A Instead of copper(II) hydroxide, copper should be used.
 - B Copper(II) hydroxide should not be added in excess.
 - C There is no need to filter to remove excess solids.
 - D Instead of evaporation to dryness, crystallisation should be used.

14. Which of the following lists the correct steps in preparing a pure, dry sample of iron(II) sulfate crystals immediately after the reaction between iron(II) carbonate and sulfuric acid has finished?
- A Crystallisation, filtration, evaporation, washing, drying.
 - B Evaporation, filtration, crystallisation, washing, drying.
 - C Filtration, crystallisation, filtration, washing, drying.
 - D Filtration, crystallisation, evaporation, drying.

15. Salt **PQ** is to be prepared by reacting the carbonate of metal **P** with the acid **HQ**. The titration method is to be used to carry out the salt preparation.

What are the solubilities of the carbonate, the acid and the salt?

	Carbonate of Metal P	Acid HQ	Salt PQ
A	insoluble	soluble	insoluble
B	insoluble	soluble	soluble
C	soluble	insoluble	insoluble
D	soluble	soluble	soluble

16. Which of the following does **not** show the appropriate reagents used for the preparation of the named salts?

	Salt	Reagents
A	lead(II) sulfate	lead(II) carbonate + hydrochloric acid
B	barium sulfate	barium nitrate + sulfuric acid
C	sodium nitrate	sodium hydroxide + nitric acid
D	magnesium chloride	magnesium + hydrochloric acid

17. Which salt gives a low yield when it is made by reacting an insoluble metal oxide with dilute sulfuric acid?

- A barium sulfate
- B copper(II) sulfate
- C iron(II) sulfate
- D zinc sulfate

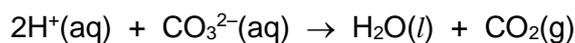
18. What are the spectator ions when aqueous sodium carbonate reacts with dilute hydrochloric acid?

- A H^+ and Na^+
- B Cl^- and CO_3^{2-}
- C H^+ and CO_3^{2-}
- D Cl^- and Na^+

19. Which row shows the ionic equation for the preparation of potassium sulfate from the corresponding reagents?

	Reagents	Ionic Equation
A	K ₂ CO ₃ and H ₂ SO ₄	$2\text{K}^+(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightarrow \text{K}_2\text{SO}_4(\text{aq})$
B	K ₂ CO ₃ and H ₂ SO ₄	$\text{K}_2\text{CO}_3(\text{aq}) + 2\text{H}^+(\text{aq}) \rightarrow 2\text{K}^+(\text{aq}) + \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g})$
C	KOH and H ₂ SO ₄	$\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l})$
D	KOH and H ₂ SO ₄	$\text{KOH}(\text{aq}) + \text{H}^+(\text{aq}) \rightarrow \text{K}^+(\text{aq}) + \text{H}_2\text{O}(\text{l})$

20. Study the ionic equation given below.



Which chemical reaction could be represented by this ionic equation?

- A** $\text{CuCO}_3(\text{s}) \rightarrow \text{CuO}(\text{s}) + \text{CO}_2(\text{g})$
- B** $\text{CH}_4(\text{g}) + 2\text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g})$
- C** $2\text{HCl}(\text{aq}) + \text{CaCO}_3(\text{s}) \rightarrow \text{CaCl}_2(\text{aq}) + \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g})$
- D** $2\text{HNO}_3(\text{aq}) + \text{K}_2\text{CO}_3(\text{aq}) \rightarrow 2\text{KNO}_3(\text{aq}) + \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g})$

- Scan the QR code below to view the answers to this assignment.



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