

Review #7: Solutions, Acids And Bases

1. Define or explain these terms.

Solution	Heterogeneous	Precipitate	Neutral solution
Solute	Alloy	Unsaturated	Neutralization Reaction
Solvent	% W / V	Saturated	Salt
Solubility	% W / W	Super-saturated	pH
Mixture	% V / V	Acid	Acid-base indicator
Homogeneous	Molar Concentration	Base	

2. Compare the physical and chemical properties of acids and bases.

3. Complete the following by writing a word, phrase or number in the space provided:

- a) An example of a solid in liquid solution is: _____
- b) An example of a gas in liquid solution is: _____
- c) An example of a gas in gas solution is: _____
- d) An example of a liquid in liquid solution is: _____
- e) An example of a solid in solid solution is: _____
- f) Two examples of alloys are: _____ and _____
- g) An acid solution tastes _____.
- h) An acid will cause bromothymol blue indicator to turn _____.
- i) All acids contain the element: _____
- j) The ion that gives bases their basic properties is the _____ ion.
- k) Acids react with metals such as magnesium and calcium to produce _____ gas.
- l) Acids react with carbonate (CO_3^{2-}) compounds to produce _____ gas.
- m) Bases taste _____ and feel _____.
- n) A base will cause the colour of phenolphthalein to turn from _____ to _____.
- o) Acids react with bases to produce _____ and a _____. This is called a _____ reaction.
- p) What pH value indicates a neutral solution? _____
- q) Sea water has a pH of 8. Is sea water acidic, basic, neutral? _____
- r) Lemon juice is **very** acidic. The pH might be (2, 5, 7, 9, 13): _____
- s) Are solutions of strong bases good or poor conductors of electricity?

4. Name these acids and bases:

HCl	HClO ₄
KOH	NaOH
NH ₄ OH	HIO ₂
HNO ₃	H ₂ S
HCH ₃ COO	HBrO ₃
H ₂ SO ₃	HI
H ₃ PO ₄	HNO ₂

5. Write a balanced chemical equation showing the reaction between:
 - a) magnesium metal and hydrochloric acid
 - b) zinc metal and acetic acid
 - c) sulfuric acid and pure calcium carbonate
 - d) hydrochloric acid and a solution of magnesium hydroxide
 - e) nitric acid and pure aluminum hydroxide
 - f) hydrosulfuric acid and a solution of sodium carbonate

6. Why are hydrogen compounds such as HCl (g) and H₂S (g) not really acids until they are dissolved in water?

7. Explain what is meant by ionization and dissociation.

8.
 - a) What is the difference between a strong acid and a weak acid. Give an example of each.
 - b) How is a concentrated solution different than a dilute solution?
 - c) How is a "strong" acid different than a "concentrated" acid?

9. A chemist mixes 50.0 mL of 18.0 M H₂SO₄ with water to make a final volume of 250 mL. What is the molar concentration of the final solution?

10. 80.0 g of lithium hydroxide is dissolved in enough water to make 500.0 mL of solution. What is the molar concentration of the solution?

11. What mass of sodium acetate is present in 600.0 mL of a 4.00 M solution?

12. What is the difference between a strong base and a weak base? Give an example of each.

13. Classify each of the following as acidic, basic or neutral:
 - a) pH 0 to 6.5 _____
 - b) pH 7 _____
 - c) pH 7.5 to 14 _____

14. Which of the following are strong acids? (Circle the strong acids)
 HCl H₂SO₄ HC₂H₃O₂ HBr H₂CO₃ H₃PO₄ NaOH NH₃

15. Write balanced chemical equations for the reactions that occur when the following solutions are mixed. Indicate any precipitates that will form.
 - a) potassium sulfate and copper (II) nitrate
 - b) lithium sulfide and barium acetate
 - c) ammonium bromide and lead (II) chlorate
 - d) sodium chloride and magnesium nitrate