

EZPZ Solutions Review

1. List some properties of water and WHY it has those properties.

- high surface tension
- high boiling point
- bent shape

polarity

2. List three ways you can increase the rate of speed at which a solid solute will dissolve in a liquid solvent:

- 1) heat up solvent (ex: water)
- 2) agitate the solution (ex: stir)
- 3) increase surface area of solute (ex: crush, sugar cube → powder sugar)

3. List two ways you can increase the solubility of a gas dissolving in a liquid solvent:
(think soda)

- 1) cool the solvent
- 2) increase pressure

4. Write what type of compound (ionic/covalent) and if it is an electrolyte or a NONElectrolyte.

Compound	Type	E/NE	Compound	Type	E/NE
② LiCl	I +-	E	② NaOH	I	E
① SiBr ₄	C no charge	non	② CaCO ₃	I	E
③ Na ₂ SO ₃	I	E	① P ₂ O ₃	C	non
① C ₁₂ H ₂₂ O ₁₁	C	non	② Ba(NO ₃) ₂	I	E

From the table above:

a) Which compound(s) will produce the greatest number of particles in aqueous solution?

Na₂SO₃ , Ba(NO₃)₂ 3 ions (particles)

b) Which compound(s) will produce the fewest number of particles in aqueous solution?

SiBr₄ P₂O₃
C₁₂H₂₂O₁₁ all 1 particle

5. If you have 2.3 moles of Al(OH)₃ in 150 ml of water, what is the concentration of your solution?

$$\rightarrow L \quad 15.333 = \boxed{15 M}$$

6. What is the volume of water that must be added to 55 ml of 1.2 M Zn(OH)₂ to lower the concentration to 0.15 M?

$$V_2 = 440 \text{ mL} - 55 \text{ mL} = 385 \text{ mL water added}$$

7. Calculate the volume of 10.2 M HCl that must be used if you want to create 500 ml of 3.00 M HCl.

$$147 \text{ mL}$$

8. How many grams of NH_4Br are needed to make 765 ml of a 1.25 M solution?

$$93.7 \text{ g } \text{NH}_4\text{Br}$$

9. What volume of a 0.130 M solution can be made from 156 g of Li_2CO_3 ?

$$16.2 \text{ L}$$

10. Thomas poured 25 mL of 0.50 M HCl into a large bottle. He then added enough water so that the new (diluted) concentration was 0.10 M HCl. How much water did Thomas add?

$$V_2 = 125 \text{ mL} - 25 \text{ mL} = 100 \text{ mL water added}$$

11. Complete the following reactions by predicting the products and balance. Determine states of the products (solid/aqueous). Write a net ionic equation if there is a precipitate and list the spectator ions.

a) Calcium chloride (aq) + sodium carbonate(aq) \rightarrow

b) Magnesium sulfate (aq) + sodium hydroxide (aq) \rightarrow

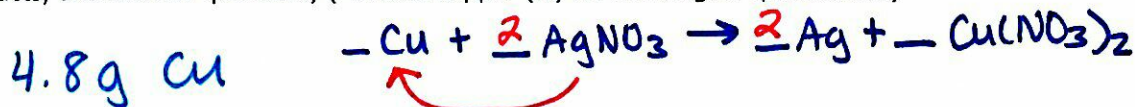
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c) Lithium phosphate (aq) + calcium nitrate (aq) \rightarrow

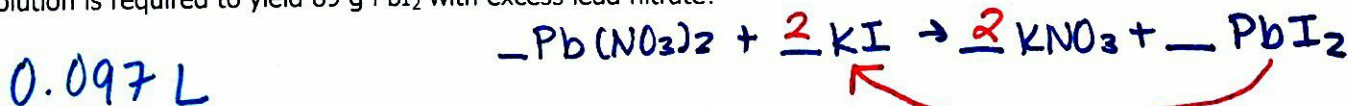
d) Potassium iodide(aq) + silver nitrate (aq) \rightarrow

e) Ammonium nitrate (aq) + zinc chloride (aq) \rightarrow

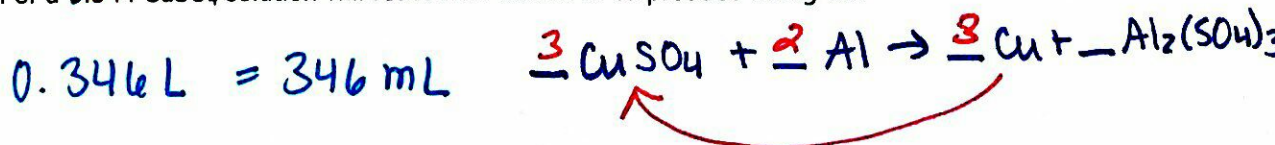
12. How many grams of Cu are required to react with 1.5 L of 0.10 M AgNO_3 ? (Hint: Write out the balanced equation, determine states of products, and answer question.) (Assume copper (II) for the single replacement.)



13. Lead (II) nitrate mixes with potassium iodide and a double replacement reaction occurs. What volume of 4.0 M KI solution is required to yield 89 g PbI_2 with excess lead nitrate?

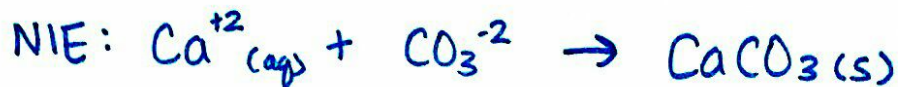
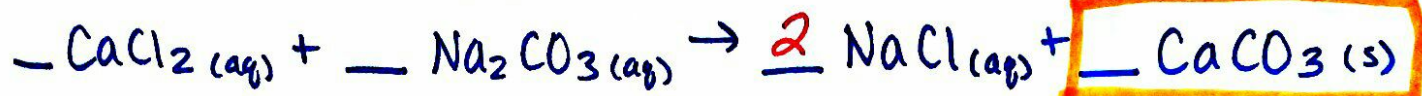


14. How many ml of a ^{0.500}~~0.5~~ M CuSO_4 solution will react with excess Al to produce 11.0g Cu?



11. Complete the following reactions by predicting the products and balance. Determine states of the products (solid/aqueous). Write a net ionic equation if there is a precipitate and list the spectator ions. = SI

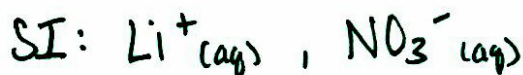
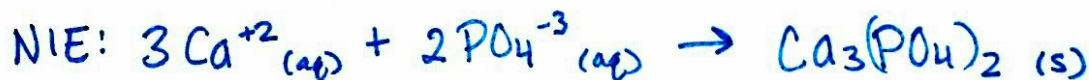
a) Calcium chloride (aq) + sodium carbonate(aq) →



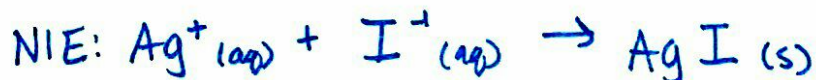
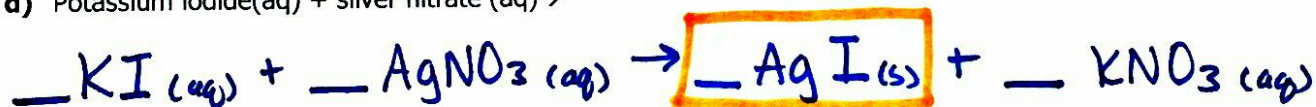
b) Magnesium sulfate (aq) + sodium hydroxide (aq) →



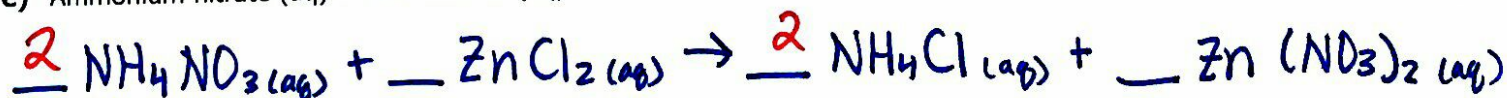
c) Lithium phosphate (aq) + calcium nitrate (aq) →



d) Potassium iodide(aq) + silver nitrate (aq) →



e) Ammonium nitrate (aq) + zinc chloride (aq) →



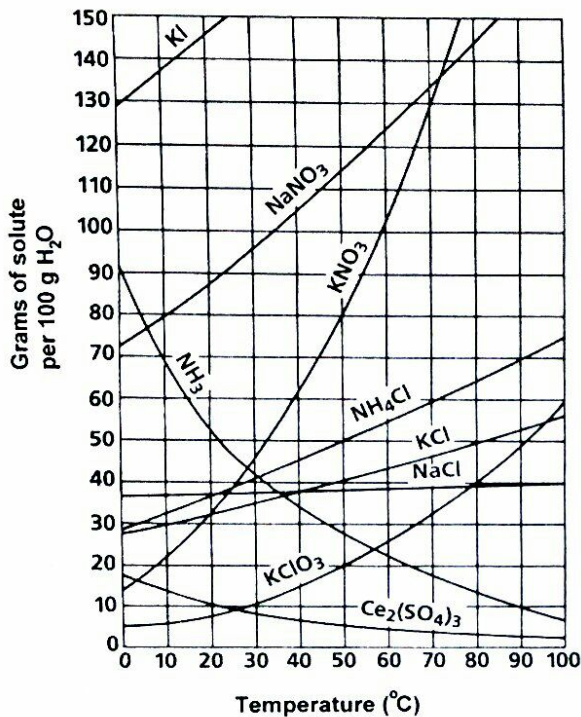
no reaction
no precipitate

(gas)

7. At room temperature (around 25°C) the solubility of carbon dioxide is 0.169 g in 100 g water. What would be a reasonable solubility for carbon dioxide in water that is 60°C?

- a. 0.335 g/100 g water
- b. 0.485 g/100 g water
- c. 0.097 g/100 g water
- d. 0.169 g/100 g water

less would dissolve
increase T



- 8. A solution that consists of 50 g of NH₃ dissolved in 100 g of water at 10°C would be:
 - a. unsaturated
 - b. saturated
 - c. supersaturated
 - d. a suspension
- 9. What is the maximum amount of KCl that can be dissolved in 100 g of water at 80°C in order to make a saturated solution?
 - a. 50 g
 - b. 80 g
 - c. 100 g
 - d. 25 g
- 10. In order to make a saturated solution, 130 g of potassium nitrate needs to be dissolved in 100 g of water at what temperature?
 - a. 100°C
 - b. 60°C
 - c. 50°C
 - d. 70°C
- 11. Which salt is most soluble at 20°C?
 - a. KClO₃
 - b. KI
 - c. NH₄Cl
 - d. NaNO₃
- 12. If a saturated solution of sodium nitrate in 100 g of water is cooled from 35°C to 10°C, how much solute will settle out of solution?
 - a. 180 g
 - b. 100 g
 - c. 20 g
 - d. 80 g

Handwritten notes: 100g, 80g
- 13. What is the maximum amount of NH₄Cl that can be dissolved in 100 g of water at 70°C in order to make a saturated solution?
 - a. 60 g
 - b. 12 g
 - c. 300 g
 - d. 600 g
- 14. Which pair of solutions will produce a clear solution of ions in water after they are mixed? (no precipitate)
 - a. Silver nitrate and sodium phosphate
 - b. Magnesium sulfate and potassium hydroxide
 - c. Potassium nitrate and zinc (II) chloride
 - d. Calcium sulfate and mercury (II) nitrate

Some multiple choice questions:

1. Benjamin made a salad dressing of vinegar and oil. No matter how hard he shook the bottle, the vinegar would not dissolve. Why?

- a. Vinegar is a polar substance, oil is nonpolar
- b. Both vinegar and oil are polar substances.
- c. Both vinegar and oil are nonpolar substances.
- d. The temperature was too low for the liquids to combine.

2. What is property of water allows for dissociation of ionic compounds in water?

- a. solute
- b. solvent
- c. Surface tension
- d. polarity

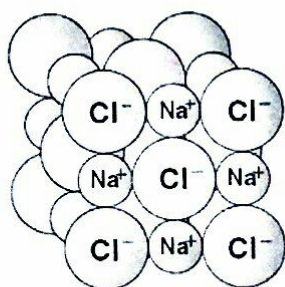
3. One reason water is an effective solvent is that it -

- a. contains the oxygen atom
- b. is a polar molecule
- c. has a freezing point of 0°C
- d. can evaporate easily

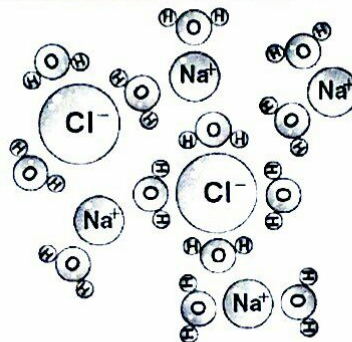
4. Which of these is a property of water due to hydrogen bonding?

- a. High surface tension
- b. Low boiling point
- c. Forms a meniscus in a plastic graduated cylinder
- d. Volume of water decreases when freezing

5. The diagram below shows water molecules and ions from a NaCl crystal. What is the most likely reason that each water molecule is arranged so that the oxygen part of the molecule faces a sodium ion?



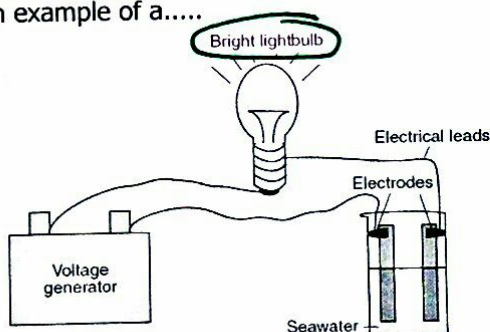
NaCl crystal



Water solution

- a. The oxygen in a water molecule contains a partial negative charge.
- b. Gravity rotates the oxygen atoms to face the more massive sodium ions.
- c. Hydrogen atoms create repulsive forces with chloride ions.
- d. Oxygen atoms form covalent bonds with sodium ions.

6. In this apparatus, the seawater is an example of a.....



- a. electrolyte
- b. diluted acid
- c. nonelectrolyte
- d. precipitate