

Pretest 2.1 Solutions

ST Part

- What's the only electrolyte-type that can have a pH of 7?
 - Why doesn't a nonelectrolyte conduct electricity?
 - What kind of ions will raise the pH from 3.0 to 8.0?
- An investigator goes into a lab after an explosion. Too large a piece of sodium had reacted with water:
$$2 \text{Na}_{(s)} + 2 \text{H}_2\text{O}_{(l)} \rightarrow \text{H}_2 + 2 \text{NaOH}_{(s)}$$
 - He sees white solid on the ceiling. What test can he carry out to reveal that the substance is a base?
 - What ion released by NaOH is responsible for its bitter taste?
 - What substance can eliminate NaOH's bitterness?
- Predict what would happen to the conductivity of aqueous sodium hydroxide if we perfectly neutralize NaOH with H_2SO_4 . Explain why the solution will /won't keep conducting electricity. If so which part returns electrons?
- What two compounds will form if HBr reacts with $\text{Ca}(\text{OH})_2$? Write a balanced equation.
- From the following list, find the most acidic substance?
 - How much more acidic is it compared to the next most acidic substance?
 - Which is the most basic?

pH

- 0 - Hydrochloric Acid (HCl) of 1M
- 1.0 - Battery Acid (H_2SO_4 sulfuric acid)
- 2.0 - Lemon Juice
- 2.2 - Vinegar
- 3.0 - Apples
- 4.0 - Wine and Beer
- 4.5 - Tomatoes
- 6.6 - Milk
- 7.0 - Pure Water
- 7.2 to 7.4 - Human Blood
- 8.3 - Baking Soda (Sodium Bicarbonate)
- 10.5 - Milk of Magnesia
- 11.0 - Ammonia
- 12.4 - Lime (Calcium Hydroxide)
- 13.0 - Lye
- 14.0 - Sodium Hydroxide (NaOH)

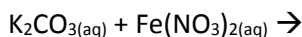
A Flash FROM YOUR HAPPY PAST

5. Convert 12 ppm to g/ml.
6. Convert 1200 ppm of salt to (m/V)% .
7. When do we use the PTA method of making a solution instead of the method involving WDTA?

STE PART (blue book pages 58 to 78)

1. 0.25 L of a 6 g/L solution are on the counter. How much of the solution should you dilute to 0.50 L to make a 2 g/L solution?
2. If it took 35.25 ml of a $\text{Ca}(\text{OH})_2$ solution to neutralize 0.98 g of H_3PO_4 , what was the molarity of the alkaline solution used?
$$2 \text{H}_3\text{PO}_{4(\text{aq})} + 3 \text{Ca}(\text{OH})_{2(\text{aq})} \rightarrow \text{Ca}_3(\text{PO}_4)_{2(\text{s})} + 6 \text{H}_2\text{O}_{(\text{l})}$$
3. What is the molarity of a 3.0 L solution containing 3.0 grams of KCl?
4. Tomatoes have a pH of 4.5. What is the concentration of H^+ in a tomato?
5. The LD_{50} for grain alcohol is 7060 mg/kg. An 85 kg man was found dead with an empty jug of vodka next to him. If the density of grain alcohol is 0.80g/ml, and the vodka is 40% alcohol, what is the least amount of vodka that was in the jug?
6. If the bioconcentration factor is 120, and if we find 120 ppm of methyl mercury in a fish, what is the concentration of the toxin in the water?
7. a) Place the following organisms in a food pyramid. The ppm are the parts per million of cadmium ion found in various organisms.
earthworm 0.30 ppm fox 2.5 ppm robin 1.0 ppm
roundworms 0.01 ppm
b) How is bioaccumulation related to how you obtained your answer in a) ?

8. Use the following solubility rules to identify the precipitate. Also complete and balance the precipitation equation.



9. Complete the following ionic equation:

10. What accounts for the fact that some electrolytes are weak even though they are ionic?

Flashback: stoichiometry

Solubility Rules for Ionic Compounds in Water				
Anion	+	Cation	=	Solubility
Any negative ion	+	Li ⁺ , Na ⁺ , K ⁺ , Rb ⁺ , or Cs ⁺	=	Soluble
Any negative ion	+	Ammonium (NH ₄ ⁺)	=	Soluble
Nitrate (NO ₃ ⁻)	+	Any positive ion	=	Soluble
Acetate (CH ₃ COO ⁻)	+	Ag ⁺ or Hg ₂ ⁺²	=	Insoluble
	+	Any other positive ion	=	Soluble
Cl ⁻ , Br ⁻ , or I ⁻	+	Ag ⁺ , Pb ⁺² , Hg ₂ ⁺² , or Cu ⁺	=	Insoluble
	+	Any other positive ion	=	Soluble
Sulfate (SO ₄ ⁻²)	+	Ag ⁺ , Pb ⁺² , Ca ⁺² , Sr ⁺² , Ba ⁺² , or Ra ⁺²	=	Insoluble
	+	Any other positive ion	=	Soluble
Sulfide (S ⁻²)	+	Li ⁺ , Na ⁺ , K ⁺ , Rb ⁺ , Cs ⁺ , or NH ₄ ⁺	=	Soluble
	+	Be ⁺² , Mg ⁺² , Ca ⁺² , Sr ⁺² , Ba ⁺² , or Ra ⁺²	=	Soluble
	+	Any other positive ion	=	Insoluble
Hydroxide (OH ⁻)	+	Li ⁺ , Na ⁺ , K ⁺ , Rb ⁺ , Cs ⁺ , NH ₄ ⁺ or Ba ⁺²	=	Soluble
	+	Any other positive ion	=	Insoluble
PO ₄ ⁻³ , CO ₃ ⁻² or SO ₃ ⁻²	+	Li ⁺ , Na ⁺ , K ⁺ , Rb ⁺ , Cs ⁺ , or NH ₄ ⁺	=	Soluble
	+	Any other positive ion	=	Insoluble