

Chemistry 100
Homework Problem Set # 4
Due Wednesday, October 1

1. Calculate the molarity of the following solutions (watch your units):

(a) 28.9 g of Na_2CO_3 dissolved in water to a total volume of 2.00 L

(b) 3.47 g of KCl dissolved in water to a total volume of 250 mL

2. Calculate the grams of solute needed to prepare each of the following:

(a) 1.0 L of a 0.320 M KI solution

(b) 1500 mL of a 2.5 M CaCl_2 solution

3. Identify the names of the following polyatomic ions:

(a) NO_3^-

(d) CO_3^{2-}

(b) SO_4^{2-}

(e) HCO_3^-

(c) NH_4^+

(f) OH^-

4. Write formulas for the following compounds containing polyatomic ions. (Be sure to balance charge using the crossover rule.)

(a) magnesium hydroxide

(d) sodium bicarbonate

(b) potassium sulfate

(e) strontium nitrate

(c) ammonium chloride

(f) sodium carbonate

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5. Calculate the pH of each solution below and identify the solution as acidic, basic or neutral.
- (a) $[H_3O^+] = 1.0 \times 10^{-5}$
 - (b) $[H_3O^+] = 8.1 \times 10^{-9}$
 - (c) $[H_3O^+] = 7.2 \times 10^{-3}$
 - (d) $[H_3O^+] = 3.9 \times 10^{-10}$
6. Write an acid dissociation equation for the following acids:
- (a) HI

 - (b) HNO₃

 - (c) H₂SO₄

 - (d) H₂CO₃
7. Belladonna is a common Homeopathic remedy and can be obtained in a wide variety of dilutions.
- (a) Look up information about the herb Belladonna online and write two complete sentences about its effects in humans. Also list your source (URL, Name of person or organization that runs the site and date accessed).

 - (b) Hyland's Earache Drops for Adults contain a homeopathic dilution of Belladonna of 30C, where "C" stands for a 1:100 dilution. As you will recall from class, the "30" refers to the dilution being repeated successively 30 times. Starting with a generous concentration of 10 M for the active ingredient(s), find out how many molecules of the active ingredient are in 1L of the final solution. (See the example in class). Comment on your results.