Analytical Chemistry

Chapter 1

by
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Activity 2

1. Calculate the formula weights of the following substances:
   a. $BaCl_2.2H_2O$
   b. $KHC_2O_4.H_2C_2O_4$
   c. $Ag_2Cr_2O_7$
   d. $Ca_3(PO_4)_2$

2. Calculate the number of milimoles contained in 500 mg of each of the following substances:
   a. $BaCrO_4$
   b. $CHCl_3$
   c. $KIO_3.HIO_3$
   d. $MgNH_4PO_4$
   e. $Mg_2P_2O_7$
   f. $FeSO_4.C_2H_4(NH_3)_2SO_4.4H_2O$

Activity 2

3. Calculate the number of grams of each of the following substances that would have to be dissolved and diluted to 100 mL to prepare a 0.200 M solution.
   a. $MgNH_4PO_4$
   b. $Mg_2P_2O_7$
   c. $FeSO_4.C_2H_4(NH_3)2SO_4.4H_2O$

4. Calculate the number of miligrams of each of the following substances you would have to weigh out in order to prepare the listed solutions:
   a. 0.500 L of 0.200 M sucrose ($C_{12}H_{22}O_{11}$)
   b. 10.0 mL of 0.500 M sucrose
   c. 0.0100 L of 0.200 M Na_2SO_4
   d. 250 mL of 0.900% NaCl (g/100 mL solution)

Activity 2

5. The chemical stockroom is supplied with the following stock solution: 0.100 M HCl, 0.0200 M NaOH, 0.0500 M KOH, 10.0% (w/v) HBr and 5.00% (w/v) Na_2CO_3. What volume of stock solution needed to obtain the following amounts of solutes?
   a. 0.0500 mol HCl
   b. 0.0100 mol NaOH
   c. 0.100 mol KOH
   d. 5.00 g HBr
   e. 4.00 g Na_2CO_3
   f. 1.00 mol HBr
   g. 0.500 mol Na_2CO_3

Activity 2

6. Calculate the molar concentrations of all the cations and anions in a solution prepared by mixing 10.0 mL each of the following solutions: 0.100 M $Mn(NO_3)_2$, 0.100 M KNO_3 and 0.100 M K_2SO_4.

7. A solution containing 10.0 mmol $CaCl_2$ is diluted to 1 L. Calculate the number of grams of $CaCl_2.2H_2O$ per mililiter to the final solution.

8. How many mililiters of concentration HCl, 38.0% (w/w), specific gravity 1.19 are required to prepare 1 L of a 0.100 M solution? (Assume density and specific gravity are equal within three significant figures).

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