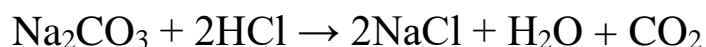


Questions

Q// How many milliliters of concentrated HCl (F.wt=36.45g/mol, 37.2% (w/w) and Sp.gr=1.19) are require for the preparation of 2.0L of 5.0 mol/L solution? Then calculate how many milliliters of this solution (5 mol/L) are required to react quantitatively with 10g of Na₂CO₃ (M.wt= 106 g/mol).

(10 Marks)



Q// Calculate H₃PO₄ molarity in the bottle from the information.

(Density of specific gravity = 1.696 g/ml, 85%)

Q// Prepare 250ml of 2M HNO₃ from the traditional solution. The information on the bottle: 69% (w/w) HNO₃, specific gravity 1.42 g/ml, formula weight 63 g/mole.

Q//Describe the preparation of 2.00 L of 0.108 M BaCl₂ from BaCl₂.2H₂O (244.3 g/mol).

Q// Describe the preparation of 100 mL of 6.0 M HCl from a concentrated solution that has a specific gravity of 1.18 and is 37% (w/w) HCl (36.5 g/mol).

Q// Describe the preparation of 750 mL of 6.00 M H_3PO_4 from the commercial reagent that is 86% H_3PO_4 (w/w) and has a specific gravity of 1.71.

Q// Describe the preparation of 900 mL of 3.00 M HNO_3 from the commercial reagent that is 70.5% HNO_3 (w/w) and has a specific gravity of 1.42.

Q// Describe the preparation of:

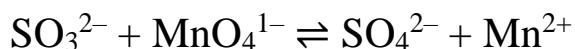
- a) 500 mL of 0.0750 M AgNO_3 from the solid reagent.
- b) 1.00 L of 0.285 M HCl , starting with a 6.00 M solution of the reagent.
- c) 400 mL of a solution that is 0.0810 M in KI , starting with solid $\text{K}_4\text{Fe}(\text{CN})_6$.
- d) 2.00 L of 0.120 M HClO_4 from the commercial reagent [71.0% HClO_4 (w/w), sp gr 1.67].
- e) 9.00 L of a solution that is 60.0 ppm in NaI , starting with solid Na_2SO_4 .

Q// Describe the preparation of:

- a) 5.00 L of 0.0500 M KMnO_4 from the solid reagent.
- b) 4.00 L of 0.250 M HClO_4 , starting with an 8.00 M solution of the reagent.
- c) 400 mL of a solution that is 0.0250 M in I_2 , starting with MgI_2 .

Q// Enumerate typical chemical methods used in separation procedures to increase selectivity of the determination process?

Q// Write the balanced net ionic equation for the following redox reaction. Supply H^+ and/or H_2O as needed to obtain balance.



Q// Drive a titration curve for **only one** of the following:

- Titration of 25 ml of 0.1 M NaOH with (10, 25, 30) mL of 0.1 M HCl.
- Titration of 50 mL of 0.01 M Cl^- with (10, 50, 60) mL of 0.01 M Ag^+ .
($K_{sp}=1.8 \times 10^{-10}$)

Atomic Weight (g/mol):

H=1, C=12, N=14, O=16, F=19, Na=23, P=31, S=32, Cl=35.45, K=39.1,
Ag=107.87

Assis. Prof. Dr. Hijran S. Jabbar

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College of Science

Department of Environ.

Sciences

Analytical Chemistry



1st Year Students

Time: 3.0 hours

Date: / 08 /

2019

2018 – 2019 / 2nd

Trail

Q1// Fill the following blanks:

(20

Marks)

- 1) Total analysis process consists of five steps:,,, quantitation and evaluation.
- 2) Natural products are made by which can be much more selective.
- 3) The metal ion (or cation) in a complex is called the, while the electron-pair donating species is called the
- 4) Molarity is the number of in of solution.
- 5) In Chromophore Theory, the groups which are responsible for the color in the organic compounds are called chromophores like, and
- 6) Separation methods involve removing of the effect of and increases the of the method towards the analyte with necessary accuracy and precision.

- 7) Equivalence point is the theoretical point in a titration when the amount of added standard reagent is to the amount of analyte.
- 8) Solutions are homogeneous mixtures, the major component is called, and the minor components are called
- 9) Precipitation titration is a titration in which the reaction between the analyte and titrant involves a
- 10) There are three types of indicators in Fajans method:,, and
- 11) Chemical Indicators are compound often added to the analyte solution to produce an at or near the equivalence point.

Q2//

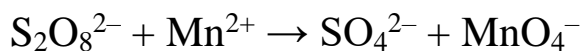
- a) Explain the properties of ideal standard solution for a titrimetric method?

(3 marks)

- b) Write the balanced net ionic equation for the following redox reaction.

Supply H^+ and/or H_2O as needed to obtain balance.

(4 marks)

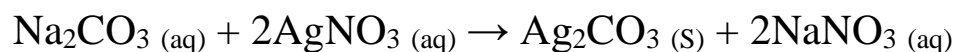


- c) The maximum allowed concentration of chloride in a municipal drinking water supply is 2.5×10^2 ppm Cl^- . When the supply of water exceeds this limit, it often has a distinctive salty taste. What is this concentration in moles Cl^-

/Liter? **(3 marks)**

Continue..... →

Q3// What will be the analytical molar Na_2CO_3 concentration in the solution remained when 25 mL of 0.2 mol/L AgNO_3 are mixed with 50 mL of 0.08 mol/L Na_2CO_3 ? **(10 marks)**



Q4// Draw a titration curve for **only one** of the following:

(10 Marks)

- Titration of 50 ml of 0.05 M HCl with (10, 25, 30) mL of 0.1 M NaOH.
- Titration of 25 mL of 0.1 M Ag^+ with (10, 50, 60) mL of 0.05 M Cl^- .
($K_{sp}=1.8 \times 10^{-10}$)

Atomic Weight (g/mol):

H=1, C=12, N=14, O=16, Na=23, P=31, S=32, Cl=35.45, Ag=107.87

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