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## Applications of conductometry ppt

Conductometry is define as the calculation of electrical conductivity of a solution. ConductanceThe current flow through the conductor is called conductance.In others words it is defined as the reciprocal of the resistance.The unit for the conductance is seimens (s).Principle of conductometry :In this method the main principle is the movements of the ions creates the electrical conductivity. The movements of the ions is depends on the concentration of ions.Theory of conductometry:The theory is mainly based on Ohm's law which states that the current(I) is directly proportional to the electromotive force(E) and inversely proportional to the resistance (R) of the conductor. $I = E/R$ Conductance is  $C = 1/R$ Factors effecting the Conductance measurement:Temperature:Conductivity of the electrolytes increases with increase in temperature because of the ions mobility by the increasing temperature.Concentration of the sample solution: The concentration of the solution, is inversely proportional to the conductivity of the sample solution. The conductivity decreases as the concentration increases. The filtered solution is therefore used for the calculation of conductivity. Number of ions present in the sample solution: This is based on the dissociation of compound into ions. That is mainly of the number of ions present in the solution. The number of ions present in the solution is directly proportional to the conductance. Strong electrolytes completely dissociates into ions and have high conductance. Charge of the ions: The negative charge of the ions increase the conductivity,Where positive charged ions decrease the conductivity.Size of the ions:The conductivity is inversely proportional to the size of the ions.The increase in the size increase the conductivity.Application of Conductometry: Conductometry is used to determine the acids ' basicity. The basicity is defined as the number of carboxylic acid groups attached to the molecules. Use in the determination of the springly soluble salts such as barium sulfate and lead sulfate.It is use in the determination of the purity of water.The determination of the salinity of the sea water.It is use in the determination of the ionic product of the water.Also use in the quantitative analysis of the compound.Read more:Potentiometer and its Application 电导 1,325 millions of speakers conductométrico 570 millions of speakers conductometric 510 millions of speakers conductometric 380 millions of speakers 280 millions of speakers кондуктометрический 278 millions of speakers condutométrico 270 millions of speakers conductometric 260 millions of speakers conductométrique 220 millions of speakers Conductometric 190 millions of speakers konduktometrischer 180 millions of speakers 電気伝導度 130 millions of speakers 85 millions of speakers Conductometric 85 millions of speakers conductometric 80 millions of speakers conductometric 75 millions of speakers 電導 75 millions of speakers Konduktometrik 70 millions of speakers conduttometrico 65 millions of speakers konduk 50 millions of speakers кондуктометрический 40 millions of speakers conductometric 30 millions of speakers αγωγιμότητα 15 millions of speakers conductometric 14 millions of speakers konduktometrisk 10 millions of speakers konduktometrisk 5 millions of speakers This article needs additional citations for verification. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.Find sources: "Conductometry" – news - newspapers - books - scholar - JSTOR (February 2018) (Learn how and when to remove this template message) Look up conductometry in Wiktionary, the free dictionary. Conductometry is a measurement of electrolytic conductivity to monitor a progress of chemical reaction. Conductometry has notable application in analytical chemistry, where conductometric titration is a standard technique. In usual analytical chemistry practice, the term conductometry is used as a synonym of conductometric titration, while the term conductivity is used to describe non-titrative applications.[1] Conductometry is often applied to determine the total conductance of a solution or to analyze the end point of titrations that include ions.[2] History Conductive measurements began as early as the 18th century, when Andreas Baumgartner noticed that salt and mineral waters from Bad Gastein in Austria conducted electricity.[3][4] As such, using conductometry to determine water purity, which is often used today to test the effectiveness of water purification systems, began in 1776.[2] Friedrich Kohlrausch further developed conductometry in the 1860s when he applied alternating current to water, acids, and other solutions. It was also around this time when Willis Whitney, who was studying the interactions of sulfuric acid and chromium sulfate complexes, found the first conductometric endpoint.[3] These finding culminated into potentiometric titrations and the first instrument for volumetric analysis by Robert Behrend in 1883 while titrating chloride and bromide with HgNO3. This development allowed for testing the solubility of salts and hydrogen ion concentration, as well as acid/base and redox titrations. Conductometry was further improved with the development of the glass electrode, which began in 1909.[3][4] Titration Conductometric titration is a type of titration in which the electrolytic conductivity of the reaction mixture is continuously monitored as one reactant is added. The equivalence point is the point at which the conductivity undergoes a sudden change. Marked increase or decrease in conductance are associated with the changing concentrations of the two most highly conducting ions—the hydrogen and hydroxyl ions.[5] The method can be used for titrating coloured solutions or homogeneous suspension (e.g.: wood pulp suspension[5]), which cannot be used with normal indicators. Acid-base titrations and redox titrations are often performed in which common indicators are used to locate the end point e.g. methyl orange, phenolphthalein for acid base titrations and starch solutions for iodometric type redox process. However, electrical conductance measurements can also be used as a tool to locate the end point. Example: titration of an HCl solution with the strong base NaOH. As the titration progresses, the protons are neutralized to form water by the addition of NaOH. For each amount of NaOH added equivalent amount of hydrogen ions is removed. Effectively, the mobile H+ cation is replaced by the less-mobile Na+ ion, and the conductivity of the titrated solution as well as the measured conductance of the cell fall. This continues until the equivalence point is reached, at which one obtains a solution of sodium chloride, NaCl. If more base is added, an increase in conductivity or conductance is observed, since more ions Na+ and OH− are being added and the neutralization reaction no longer removes an appreciable amount of H+. Consequently, in the titration of a strong acid with a strong base, the conductance has a minimum at the equivalence point. This minimum can be used, instead of an indicator dye, to determine the endpoint of the titration. The conductometric titration curve is a plot of the measured conductance or conductivity values as a function of the volume of the NaOH solution added. The titration curve can be used to graphically determine the equivalence point. For reaction between a weak acid and a weak base in the beginning conductivity decreases a bit as the few available H+ ions are used up. Then conductivity increases slightly up to the equivalence point volume, due to contribution of the salt cation and anion.(This contribution in case of a strong acid-strong base is negligible and is not considered there.) After the equivalence point is achieved the conductivity increases rapidly due to the excess OH- ions. References ^ Khopkar, S.M., "Basic Concepts of Analytical Chemistry", 3rd edition, 2007, ISBN 978-81-224-2092-0. ^ a b Braun, R.D., "Chemical Analysis". Encyclopædia Britannica. Encyclopædia Britannica Online. Encyclopædia Britannica Inc., 2015, Web, 07 Dec. 2015. ^ a b c Lubert, K. and K. Kalcher, "History of Electroanalytical Methods". Electroanalysis, 2010, 22, 1937-1946. ^ a b Stock, T., "A Short Course on the History of Analytical Chemistry and the Related Sciences". Journal of Chemical Education, 1977, 54, 635-637. ^ a b Katz et al., 1984 S. Katz, R.P. Beaton and A.M. Scallan, The determination of strong and weak acidic groups in sulfite pulps. Svensk Papperstidn. 6 (1984), pp. 48-53. Retrieved from " LinkedIn emplea cookies para mejorar la funcionalidad y el rendimiento de nuestro sitio web, así como para ofrecer publicidad relevante. Si continúas navegando por ese sitio web, aceptas el uso de cookies. Consulta nuestra Política de privacidad de privacidad y nuestras Condiciones de uso para más información. DEFINITION :- Conductometry is defined as determination or measurement of the electrical conductance of an aq. electrolyte solution by means of a conductometer. PRINCIPLE :- It is based on the conductance of electrical current by aqueous electrolyte solutions in a manner similar to that of metallic conductors. The electrical conductance is in accordance with the ohm's law which states the strength of current passing through a conductor (in this case electrolyte solution.) is directly proportional to the potential difference applied across the electrodes and inversely proportional to the resistance offered by the conductor i.e., i=v/R where, i= current v=potential difference R= resistance (ohms Ω) SOME IMPORTANT TERM DEFINITION :- 1.SPECIFIC CONDUCTANCE (K):- Specific conductance of a homogenous body may be defined as the conductance of the body of uniform length and uniform area of cross section(A). I.E.  $G = K A/L$  K= G L/A WHERE, K = SPECIFIC CONDUCTANCE UNITS :- Ohm- cm- Specific conductance is also defined as reciprocal of specific resistance. 2.Molar conductance (Λ) :- It is defined as the conductance of a solution containing 1 mole of the solute in 1000 cm3 of the solution which is placed between two parallel electrodes which are 1 cm apart.  $\Lambda = 1000k/c$  K = specific conductance (ohm-1 cm-1) C = molar concentration (moles/cm3) UNITS :- Ohm-1 cm2 mol-1 3.Equivalent conductance (Λeq):- It is defined as the specific conductance (k) of a solution containing 1 gm equivalent of solute in 1000 cm3 of solution.  $\Lambda_{eq} = 1000k/c_{eq}$  where, k= specific conductance ceq = Equivalent concentration unit :- ohm-1 cm2 equi>-1 4. Ohm's Law :- the current flowing in a conductor is directly proportional to the applied electromotive force and inversely proportional to the resistance of the conductor I=E/R 5. Kohlrausch law :- At infinite dilution each ion contribute definite amount of conductance to total conductance irrespective nature of other ions. CONDUCTOMETRY THEORY :- In conductometric titration the end point is detected by measuring the change in the electrical conductance of the solution which is being titrated. Generally the conductometric titrations is based on the conduct of a solution and depends on the concentration and conductive of the ions. It is also based on the substitutions of one mobility by the ion of another mobility. Ex:- Addition of HCl to ammonium hydroxide H+ Cl- + NH4+ OH- → NH4Cl + H2O The high conductivity H ions (350) are replaced by low conductivity NH4 ions (73). FACTORS AFFECTING CONDUCTANCE :- No. factor Effect on conductance 1. Type of current Always A.C is used to prevent polarization of electrode in conductivity. As the frequency of current increases, conductance increases. 2. Type of solute Strong electrolytes have higher conductance. 3. Charge on ions As ionic charge increases molar conductance increase (SO+2 Cl-) 4. Size of ions As the size of ions increases, conductance decrease 5. Mobility of ions / Spread of ions Absolute velocity of any ion under influence of 1 volt potential per cm is called ionic mobility. 6. Viscosity High viscosity low conductance 7. Temperature High temperature High conductance 1 C rise in temp. cause 2% rise in mobility of ions. APPLICATION OF CONDUCTOMETRY :- Finding conductance of unknown compound. salt analysis. Ionic product of water. Determination of solubility and Ksp of sparingly soluble compound. Determination of mode of ionization of complex compound. Conductometric titration & precipitation titrations. Purity of water. MCQ:- 1. Which is working principal of conductometry ? a. measurement of potention. b.measurement of conductivity of solution. c.measurement of emf. d. none of the above 2. which equation is explained ohm's law ? a.  $K = G L/A$  b.i=E/R c.  $\Lambda_{eq} = 1000k/c_{eq}$  d.  $\Lambda = 1000k/c$  3. The specific conductance (k) of a solution containing 1 gm equivalent of solute in 1000 cm3 of solution." this sentence shows which term definition? a Ohm's Law b SPECIFIC CONDUCTANCE c.Molar conductance d. Equivalent conductance (Λeq) 4. Which is not application of conductometry ? a. determine of moisture and water contain b.Purity of water c.Ionic product of water. d. Conductometric titration & precipitation titration 5. In conductometry solution if temp. is increase by 1% a.1% rise in mobility of ions. b.2% rise in mobility of ions. c.3% rise in mobility of ions. d.4% rise in mobility of ions. 6.Kohlrausch law is a. the current flowing in a conductor is directly proportional to the applied electromotive force and inversely proportional to the resistance of the conductor b.At infinite dilution each ion contribute definite amount of conductance to total conductance irrespective nature of other ions. c.Specific conductance of a homogenous body may be defined as the conductance of the body of uniform length and uniform area of cross section(A) d.It is defined as the conductance of a solution containing 1 mole of the solute in 1000 cm3 of the solution which is placed between two parallel electrodes which are 1 cm apart. 7. if the ion size is decrease in solutions a.conductance decrease b.conductance increase c.a and b d.none of the above ANSWER KEY :- 1.B 2.B 3.D 4.A 5.B 6.B 7.B For More Standard and Quality Question Bank you can Join Our Test Series Programme for GPAT, NIPER JEE, Pharmacist Recruitment Exam, Drug Inspector Recruitment Exams, PhD Entrance Exam for Pharmacy Participate in Online FREE GPAT TEST: CLICK HERE Participate in Online FREE Pharmacist TEST: CLICK HERE Participate in Online FREE Drug Inspector TEST: CLICK HERE REFERENCE :- TEXT BOOK OF PHARMACEUTICAL ANALYSIS THIRD EDITION DR. 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