Chemistry with inorganic qualitative analysis pdf

Although this type of analysis has been replaced by instrumental methods that have rendered the application of periodic table and group divisions obsolete, it is still useful to understand how much work had to be done by the first analytical chemists to rationalize the quantitative analysis of anions and citations, and how this allowed them to come up with pre-series, albeit tedious, to identify most of the most common anions and cations. Even superficial knowledge of quantitative analysis is important in the sense that it helps to shape the thinking needed for an analytical approach. It also answers the first basic question we ask ourselves when faced with an unknown pattern: what elements make up this sample? The qualifying analysis consists of the analysis of cotions and anions found in the samples found. Different methods have been developed based on the different chemical/physical characteristics of analytic to be determined. Let's take a mixture containing, for example: Age, PBK, Hg2, Al, Theo, Krz, Me No Reactive, which reacts in one particular way with different ions, actually anions and cations interfere with each other. In practice, the ions are divided not individually, but into groups based on their behavior in relation to specific reactive reactions, called group or selective reactive, which cause the same reaction in all elements belonging to this group. That is why this type of analysis is called systematic analysis. To conduct a full analysis you need a good knowledge (theory) of all the reactions that anions or cations can be involved in, and you need to acquire good leadership skills (practice) to avoid mistakes. Systematic study of cations using wet analysis involves dissolving the substance into the appropriate solvent in the first place. Before that, however, we should check the presence of certain substances such as complex cyanides, silicates and silicon dioxide, which interfere with analysis by getting rid of them if necessary. If the original sample is solid, it is also necessary to convert it into a solution, so a step-by-step approach is required: cold water, hot water, acidic water, aqua-resi (nitrogen acid and salt acid usually in a volume ratio of 1:3) and sulphuric nitrogen attack (nitrogen acid and sulphuric acid in a ratio of 1:3 and hot). Salt tests are carried out on a small amount of matter (about 30 mg in vitro) first at room temperature, then with warm water, then with diluted and then concentrated HCL (hydrochloric acid), then with diluted and then concentrated nitric acid (HNO3) and finally with aqua-regis if necessary (HCl c HNO3 c 3:V/ V). These tests are very useful because they allow us to exclude, using a table salt, the availability of specific specific Examples: if the sample is soluble in cold water, it assumes that there are no insoluble compounds such as AgCl, AgBr, etc. present. However, this does not exclude the possibility that H2O contains aghe compounds in the form of AgNO3, soluble in H2O; If one imagines, on the other hand, that the sample is soluble in hot water, the sample contains analyses with the average value of Kps (soluble equilibrium); a typical example is lead chloride (PbCl2); If the sample is completely dissolved in the treatment of HNO3, any analites are present those that are soluble in acids like ferric hydroxy (Fe(OH)3) and ferrosious hydroxide (Fe(OH)2) and contracting those that are not attacked by acids like ancient sulfides like NiS and CoS. Once the sample has been turned into a solution, a systematic analysis can be carried out. Let's start by adding the first reactive chloric acid, which leads to the sediment of the first four cats: Age, PBH, Hg2, in the form of chlorides and WO3, which belong to the sixth periodic group. After adding a reactive group, the next step is to digest the sediment (if necessary), which promotes the increase in sediment and thus facilitates the next step, which is the filtration of the sediment. The sediment is filtered using filter paper and a solution used to analyze the next group. The sediment is washed in water containing a suitable electrolyte. (In general, ammonium chloride is used to prevent losses from dissolving, and only at this point begins the procedure of analysis of individual analyses. , sodium chromat can be added and then yellow lead chromat can be seen. Unlike cations, there is no systematic analysis of ions, so this means they need to be found to use wet analysis. Analysis of anions begins with the main solution Na2CO3 (sodium carbonate), which serves to eliminate any color interference from the presence of iron, manganese or nickel. The solution is then analyzed for the presence of decreasing anions and oxidizing anions. Part of the solution is acidified by H2SO4 (sulphuric acid) and heated to about 60 to 70 degrees Celsius, so that excess carbonates (CO32-) and bicarbonates (HCO3) are eliminated in the form of CO2 (carbon dioxide). Potassium permanganate (KMnO4), a powerful oxidizing agent, is then added to a solution of sulphuric acid, making it purple. In the conditions of reduction, the solution loses its color. 3MnO42- 4H- → 2MnO4- MnO2 and 2H2O; that may indicate the presence of ions like: I-; Br-, S2-; SO32-; S2O52-. The search for hydrogen sulfide anion oxidation is added to the solution part, and it is a strong reducing agent. The formation of sulphur deposition indicates the presence of decreasing anions. HI (hydrogen iodide) can also be added to the solution and in the presence of oxidizing molecules it reduces to I2, which turns the solution into yellow. Alternatively, starch sauce can be added, which is colorless in the presence of I- blue with I2. These tests are based on the fact that Na2B4O7 No. 10 H2O (Borax) reacts in molten state with various metal compounds to the formation of glass substances that have a certain color, while the rig ball itself is colorless. Once the ball has formed it has come into contact with the substance under consideration and then heated over the flame again. Many salts decompose to produce the appropriate oxide, which then stains the ball. Na2B4O7 - 10 H2O - Na2B4O7→ - 10 H2O Na2B4O7 OF BORAX OVER THE FLAME (colorless) Example: Cr2 (SO4)3 - Cr2O3 - 3 SO3 Cr2O3 - 3 B2O3 - 2 Cr (BO2)3 (green). The test of the drill ball consists in melting some borax crystals into a small ball that a few compound crystals in question can then attach to. Then the ball is heated in the Bunsen flame, first in the contraction area and then in the oxidative region. The ions present in the complex give the beads a certain color, which indicates their presence. Source: Wikipedia Territorio Scuola These tests depend on properties typical of many salts, especially in groups I and II, changes in the color of The Bunsen flame. The color comes from the radiation of light radiation, which is produced when the excited valence electrons in the atom move from one orbital to another with a higher level of energy. The only atoms or ion that can produce colored compounds are atoms with an external electronic configuration that allows electrons to move. The wavelength of radiation emitted is specific to a single element. Fiery tests and tests of the ball drill were superceded with the advent of instrumental analysis. These devices can be found in any modern laboratory and have rendered the old tests obsolete. However, it is important to understand the historical importance of finding analytical solutions to complex chemical problems, such as determining which elements are contained in an unknown sample and in what quantities. The main instrumental methods used today to identify metal elements are: atomic absorption spectrometry, AAS and inductively related mass spectrometry (ICP-MS). Chemistry with inorganic qualifying analysis is a textbook that describes the application of the principles of equilibrium presented in qualitative analysis and the properties of ions arising from the reactions of the analysis. The book examines the chemistry of inorganic substances as the science of matter, units of measurement used, atoms, atomic structure, thermochemist, nuclear chemistry, molecules and ions in action. The text also describes chemical links, representative elements, changes in condition, water and hydrosphere (which also covers water pollution and water purification). Water purification occurs in nature through the usual water cycle and the action of microorganisms. The air washes away dissolved gases and volatile pollutants; When water seeps through the soil, it filters the solids as they settle at the bottom of the calm lakes. Microorganisms break down large organic molecules, containing mainly carbon, hydrogen, nitrogen, oxygen, sulfur or phosphorus, into harmless molecules and ions. The text notes that natural cleansing occurs if the level of contaminants is not so excessive. This textbook is suitable for both chemistry teachers and students. Page 2Page 3Page 4LEARN ABOUT THESE METRICSArticle Views are COUNTER-compatible amounts of full text downloads from November 2008 (both PDF and HTML) in all agencies and individuals. The quotes number of other articles with reference to this article are calculated by Crossref and updated daily. Find more information on Crossref citation counts. 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