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## Requirements for a primary standard

A primary standard should meet the following requirements: 1. Purity: it should be available in a very pure form. It should also store in a pure state. 2. Stability: it should be stable (to 110 ÅjC- 120Å ÅjC). There are no chemical changes occurred. 3. Inaltered: the substance must be unchanged in the air during weighing, this condition implies that it should be hygroscopic, oxidized by the air or struck by CO2. The standard should maintain an unchanged composition during storage. 4. Test procedure: The substance should be able to be tested for immurities by qualitative and other known sensitivity tests. (The total amount of impurity must not exceed 0.01% -0.02%) 5. Molecular weight: should have a high molecular weight so that weighing errors can be negligible. 6. SOLUBILITY: it must be easily soluble in the solvent. 7. titration error: the reaction with the standard solution should be stokeometer and practically instantaneous. The titration error should be negligible or easy to determine accurately from the experiment. A primary standard in metrology is a standard that is sufficiently accurate in such a way as not to be calibrated or subordinate to other standards. The primary standards are defined through other quantities such as length, mass and time. The primary standards are used to calibrate other standards called standards. [1] [2] See Hierarchy of the standards. In the chemistry standards they are used in analytical chemistry. Here, a primary standard is generally a reagent that can be weighed easily, and that it is so pure that its weight is really representative of the number of moles of a substance contained. The characteristics of a primary standard include: high purity stability (low reactivity) low hygroscopicity (to minimize weight changes due to humidity) high equivalent weight (to minimize weighing errors) [3] not- Ready and economical toxicity (the last two are not as essential as the first four.) Some examples of primary standards for the titration of solutions, based on their high purity, are provided: [4] Trixide Arsenic for the realization of the Arsenite solution sodium for the standardization of the periodic sodium solution (up to pH. EUR. 3. Appendix 2001 also for iodine and cerium solutions (iv) sulphate solutions, from the moment of pH. EUR. 4. 2002 standardized by sodium thiosulfate) Benzoic acid for the standardization of waterless base solutions: ethanol sodium and potassium hydroxide, TBAH and methanol methanol methanol, isopropanol, or Potassium bromate DMF (KBRO3) for the Standardization of sodium liquid solutions Ftalate hydrogen potassium solutions (usually called KHP) for standardization of the aqueous base and perchloric acid in sodium carbonated acid acid solutions for standardization of aqueous acids: hydrochloric solutions, sulfuric acid and Nitric acid (but non-acetic acid acid) sodium chloride for standardizing silver acid nitrate solutions for sodium nitrite solutions dust, after being dissolved in sulfuric or hydrochloric acid, for standardization of EDTA solutions These standards are often used to make standard solutions. These primary standards are used in titration and are essential to determine unknown concentrations [1] or preparing work standards. See also technical standard references ^ A B Skoog, Douglas A., Donald M. West and F. James Holler. "Fundamentals of analytical chemistry 8 Å ^ ed." Harcourt Publishers Brace College. 1995 IsbnÅ, 0-03-035523-0 ^ Holt Science and Technology: Physical Sciences. Ed. Rinehart and Winston, inc. Holt. Holt McDougal (July 2000). Isbn. ^ ^ European Pharmacopoeia, Chapter 4.2.1 External Analytical Links. Department of Chemistry, University of Adelaide, Australia. Recovered by ^ Standardization refers to the search for the exact concentration of a prepared solution using a standard solution as a reference. reference. Solutions are precisely known concentration solutions, prepared using standard substances. There are two types of standard solutions known as primary and secondary solution solution. A primary standard solution is a solution with high purity and less reactivity. A secondary standard is not that pure and is chemically reactive compared to primary standards. This is the main difference between primary and secondary standard solution. Key areas considered 1. What is a primary standard solution. Å. Å. Å. Å. Å. definition, specific properties, examples 2. What is a secondary Standard Solution, Å. Å. Å. Å. Å. Definition, properties, examples 3. What is the difference between primary and secondary standard solution. Å. Å. Å. Å. a comparison between key differences Key terms: hygroscopics, primary standard, reference material, secondary standard, solvents, standardization What is a standard primary solution of primary standard solution are solutions made of primary standard substances. A primary standard is a high note purity substance (99.9% pure) which can be dissolved in a known volume of solvent that sends a primary standard solution.å primary rules are reagents that can involve in chemical reactions. These compounds are often used to determine the unknown concentration of a solution that can undergo a chemical reaction with the primary standard. Primary rules include special chemical and physical properties. These compounds are extremely pure and highly stable. Therefore, we can get pure solutions using these compounds. For example, if we want to prepare a standard solution of 0.1 MOLL-1 concentration, we can calculate the weight of the primary sample required for this and then dissolve this amount in a suitable solvent. This is exactly the MOLL-1 solution of 0.1 with a high degree of purity. Standardizing the solutions is a concept of analytical chemistry that is required for the accuracy of a titration. First we use any solution in a titration process, all solutions should be standardized with a primary standard solution. This is why, even if weighs the exact amount of a compound that is necessary to prepare a MOLL-1 solution 0.1, will not give exact concentration (due to the presence of impurity). However, since the concentration of the primary standard solution is accurate at 99.9%, we are able to hold the solution prepared with an adequate primary standard solution to find the exact concentration of the prepared solution. Figure 1 : normalization takes place as a primary titration standard are highly pure because of their low reactivity. If these compounds were highly reactive, which could get contaminated with many other chemicals, forming the impure. Primary standards are less hygroscopic. Therefore they do not absorb air moisture in considerable amounts. This also makes the primary samples highly composed pure. Examples of primary standard solutions and their applications solution Potassium application Bromato (KBRO3) used for the standardization of sodium chloride sodium thiosulphate solutions (NACL) used as a primary standard for silver nitrate zinc powder used to standardize solutions EDTA A secondary standard solution is a solution that is specifically made for a specific analysis. A secondary standard is an active substance as an agent contained were found for comparison with a primary standard. This means that it is usually standardized compared to a primary sample. Secondary standard solutions are used to calibrate analytical equipment and analytical techniques. These solutions do not meet the requirements of a primary standard. A secondary standard has a lower purity to a primary sample. These are Stable and chemically reactive compared to primary standards. Therefore these compounds can get contaminated. Figure 2: potassium permanganate solution is a secondary standard solution. Anhydrous sodium hydroxide is a secondary standard. It is highly hygroscopic. Potassium permanganate is another compound compound It is often used as a secondary standard. It is less stable and is reactive. Therefore, when preparing a potassium permanganate solution, it must be standardized with a primary sample. Primary definition Standard solution: standard primary solutions are solutions made of primary standard substances. Secondary Standard Solution: Secondary standard solutions are solutions made specifically for a specific analysis. Purity Primary standard solution: standard primary solutions are extremely pure (about 99.9%). Secondary Standard solution: Secondary standard solutions are not very pure. Primary reactivity Standard solution: primary standards are less or less responsive. Secondary standard solution: secondary standards are reactive compared to primary standards. Primary water absorption Standard solution: primary standards are not hygroscopic. Secondary standard solution: secondary standards are a bit hygroscopic. Applications Primary standard solution: standard primary solutions are used to standardize secondary standards and other reagents. Secondary Standard solution: Secondary standard solutions are used for specific analytical experiments. Conclusion Standard solutions can be divided into two groups such as standard primary and secondary solutions. Standard primary solutions are solutions made of primary standard substances. Secondary standard solutions are not as pure as primary standard solutions. Purity is the main difference between primary and secondary standard solution. References: 1. Helmenstine, Ph.D. Anna Maria. Å. information on primaries and secondary Secondary in Chemistry.Å € thoughtco, available here.2. A standard solution.Å € ipac gold book, available here.3. Libretexts. Å € Libretexts, Libretexts, 23 December 2016, available here. For kind permission image: 1. 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