Standardization Standardization is used to determine the exact concentration of a prepared solution.. Titrations are used to determine the unknown concentrations of samples. Standardization is an analytical technique can be used to find an unknown concentration using a primary or a secondary stander solution. The most commonly used technique for standardization of a solution is titration. For a standardization process, a standard solution is required as a reference. Standard solutions come in two types as primary standard solutions and secondary standard solutions. A standard solution is a solution of accurately known concentration which can be prepared by dissolving a primary standard in a suitable solvent (such as distilled water). The primary standard is a soluble solid compound that is very pure, with a consistent formula that does not change on exposure to the atmosphere, and has a relatively high molar mass. Primary standard solution A primary standard solution must: 1. Be pure (99% pure) 2. Be very stable (i.e. not react with other chemicals) 3. Be readily available and inexpensive 4. Not change its size (i.e. solid primary standards) if exposed to air 5. Be very large in size (mass) to help minimize weighing errors Secondary standard solution A secondary standard is a chemical or reagent which has certain properties such as. (a) It has less purity than primary standard. (b) Less stable and more reactive than primary standard. (c) But its solution remains stable for a long time Titration Titration is an analytical technique can be used to determine the concentration of a certain chemical species in a solution. Titration can be carry out using a solution has a known concentration. Titrations can be classified as: ● Acid–base Titrations. ● Redox Titrations. Oxidation – reduction reaction ● Precipitation Titrations. ● Complexometric Titrations The main difference between standardization and titration:– Standardization vs. Titration Standardization Titration Definition Standardization is an analytical Titration is an analytical technique used to find an technique used to determine the unknown concentration using a concentration of a certain primary or secondary standard chemical species in a solution. solution. Solution in Contains the primary or Contains a standardized burette secondary stander solution solution Solution in Contains the solution to be Contains the solution in which titration flask standardized needed to find the concentration Application Used to standardize solution Used to find unknown concentration of solutes or solution. Preparation and standardization of oxalic acid Principle COOHCOONa 2NaOH 2H2O COOHCOONa Preparation of 0.1N of oxalic acid C2H2O4.H2O----------126/2 = 63g = 0.1= = 6.3g/L = 0.1N Preparation of stander solution of 0.1N NaOH NaOH ------40g/L=1N NaOH ------4g/L=0.1N Methodology 1. Take NaOH stander solution in the burette 2. Take 10ml of oxalic acid 0.1N in the Erlenmeyer flask 3. Add 2–3 drops of phenolphthalein as indicator 4. Titration is carried out by stander of 0.1NaOH solution