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PRIMARY STANDARD AND SECONDARY STANDARD

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Primary Standards

A primary standard is a reagent having the known concentration and used to determine the concentration of the different analyte.

Properties

- **extremely pure**
- **stable**
- **has no waters of hydration**
- **has a high molecular weight.**



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e.g, Some primary standards for titration of acids: sodium carbonate:

mol wt. = 105.99 g/mol tris -(hydroxymethyl) amino methane

(TRIS or THAM): mol wt. = 121.14 g/mol

Some primary standards for titration of bases: potassium hydrogen

phthalate (KHP): mol wt. = 204.23 g/mol potassium hydrogen

iodate: mol wt. = 389.92 g/mol

Some primary standards for redox titrations: potassium dichromate

mol wt. = 294.19 g/mol



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SECONDARY STANDARD

- **secondary standard is a standard that is prepared in the laboratory for a specific compound or element analysis analysis.**

- **Properties-**

standardized against a primary standard.

- **Unknown concentration.**
- **Not pure**

e.g- Sodium hydroxide Potassium hydroxide



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Difference Between Primary and Secondary Standard Solution

1. Definition

- **Primary Standard Solution:** Primary standard solutions are solutions made out of primary standard substances.
- **Secondary Standard Solution:** Secondary standard solutions are solutions made specifically for a certain analysis.

2. Purity

- **Primary Standard Solution:** Primary standard solutions are extremely pure (about 99.9%).
- **Secondary Standard Solution:** Secondary standard solutions are not very pure.



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- **Primary Standard Solution: Primary standards are less or not reactive.**
- **Secondary Standard Solution: Secondary standards are reactive than primary standards.**

4. Water Absorption

- **Primary Standard Solution: Primary standards are not hygroscopic.**
- **Secondary Standard Solution: Secondary standards are somewhat hygroscopic.**

5. Applications

- **Primary Standard Solution: Primary standard solutions are used to standardize secondary standards and other reagents.**
- **Secondary Standard Solution: Secondary standard solutions are used for specific analytical experiments.**



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THANK YOU