Primary & Secondary Standard

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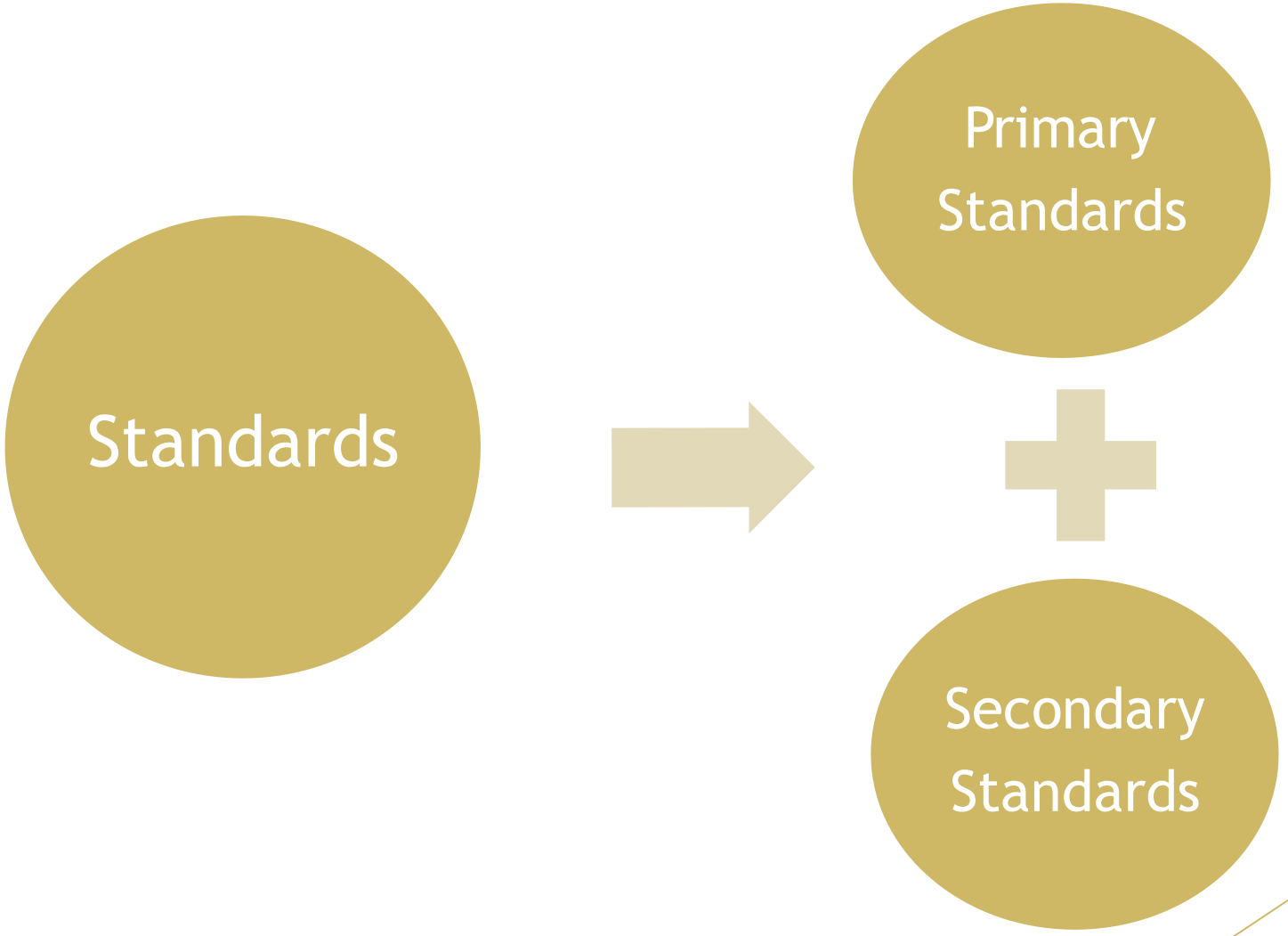
- **Standards**
- In Pharmaceutical Analysis, the word standard means a material containing a substance of our interest with a known concentration. We can express this with definite numbers with proper units.
- **Functions**
  - To provide a reference using which we can determine unknown concentration of solution
  - To standardization of volumetric solutions
  - Preparation of secondary standard
  - To calibrate an instrument

Primary and Secondary Standards



- **Primary Standards**
- Primary standard is a reagent which is very pure, generally representative of the number of moles the substance contains and easily weighed.
- A Primary standard is a reagent that’s stable, it’s not a hydrate /has no water of hydration, and has a high molecular weight.

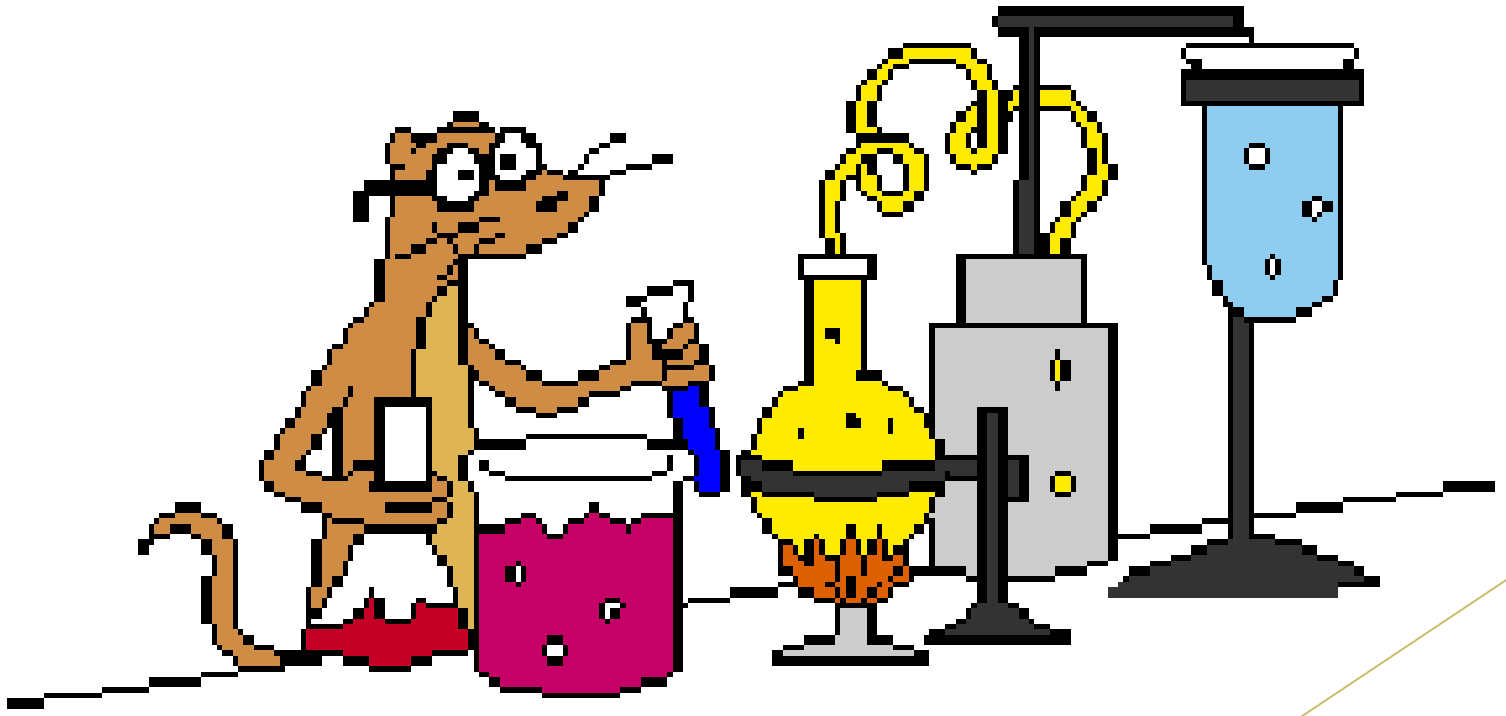
- Primary standards are typically used in titration to determine an unknown concentration and in other analytical techniques.
- High level of purity, low reactivity (high stability), high equivalent weight (to reduce error from mass measurements)
- Not hygroscopic (to reduce changes in mass in humid versus dry environments), non-toxic, inexpensive and readily available
- It should have a high relative molecular weight so that weighing errors may be negligible.
- The substance should be readily soluble under the conditions in which it is employed.

- **The substance commonly employed as primary standards are mention below…**

- **Acid- base reactions:** sodium carbonate Na_2CO_3, sodium tetraborate $Na_2B_4O_7$, potassium hydrogenphthalate $KH(C_8H_4O_4)$, potassium hydrogeniodate $KH(IO_3)_2$.

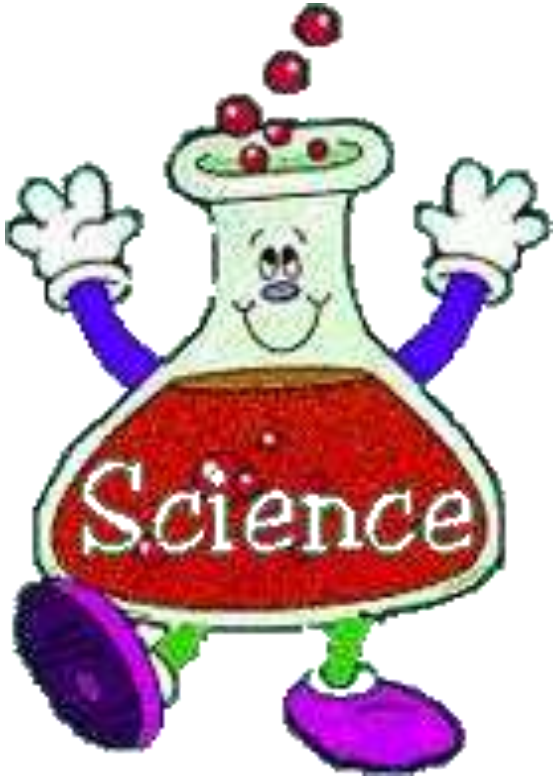
- **Complex formation reactions:** pure metals (zinc, copper, magnesium and manganese) and salts, depending upon the reaction used.

- **Precipitation reactions**: silver, silver nitrate, sodium chloride, potassium chloride and potassium bromide.
- **Oxidation- reduction reaction:** potassium dichromate ($K_2Cr_2O_7$), potassium bromate (KBr), potassium iodate (KIO_3), sodium oxalate $Na_2C_2O_4$ and pure iron.



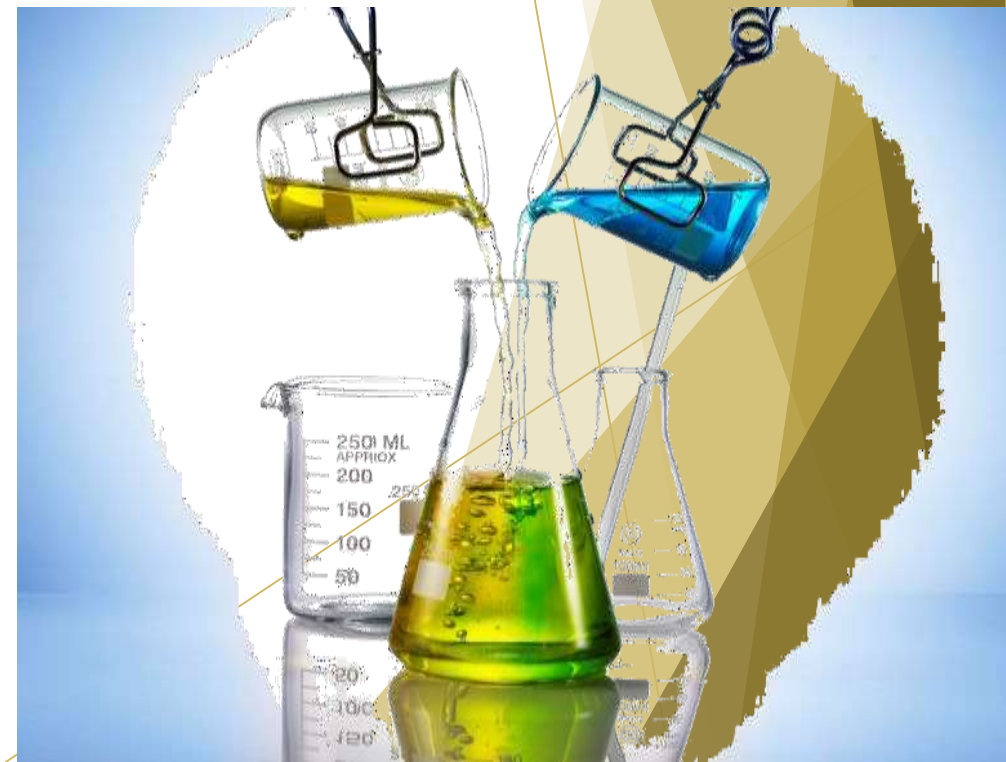
- **Secondary standard**
- Secondary standard is a chemical that has been standardized against a primary standard for use in a specific analysis. Secondary standards are commonly used to calibrate analytical methods.
- A secondary standard is a substance which may be used for standardization
- A **secondary standard** is a **standard** that is prepared in the laboratory for a specific analysis. It is usually standardized against a **primary standard**.

- It follows that a secondary standard solution is a solution in which the concentration of dissolved solute has not been determined from the weight of the compound dissolved but by reaction (titration) of a volume of the solution against a measured volume of a primary standard solution.



- **A secondary standard is a chemical or reagent which has certain properties such as….**

- It has less purity than primary standard
- Less stable and more reactive than primary standard But its solution remains stable for a long time
- Titrated against primary standard



References

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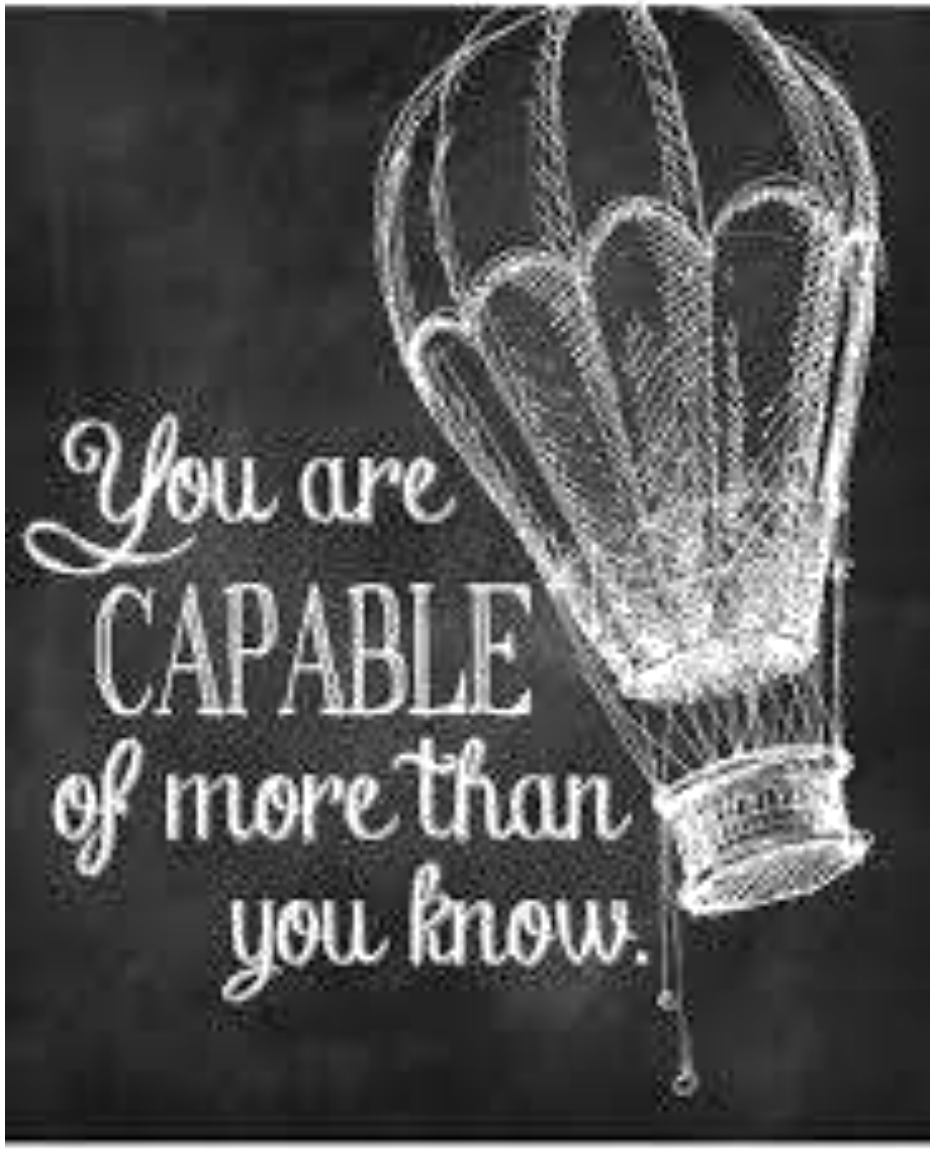

Thank You...!!!