

Lab of Analytical Chemistry

1st stage

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Lecture 3: Prepare standard solutions

Department of Medical Biotechnology



Experiment Name: Standard Solutions

Objective: Prepare standard solutions of solid

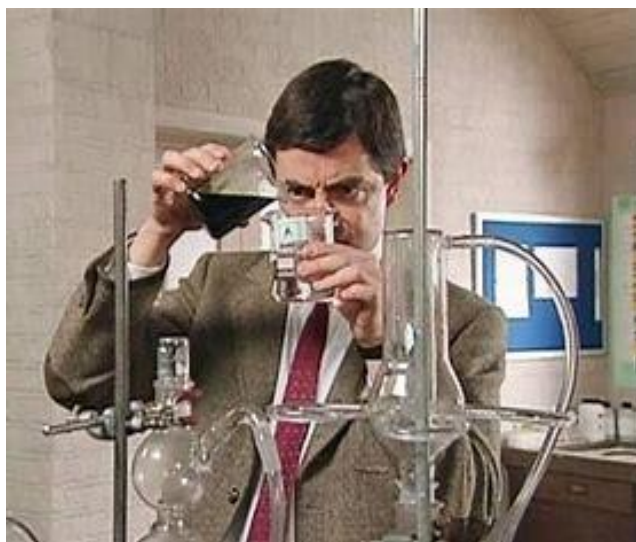
Theory:

Standard Solution

A standard solution is one with a specific concentration, where a certain volume contains a known amount of dissolved substance (solid or liquid). It is used to prepare calibration or standard curves.

Requirements for Standard Substances:

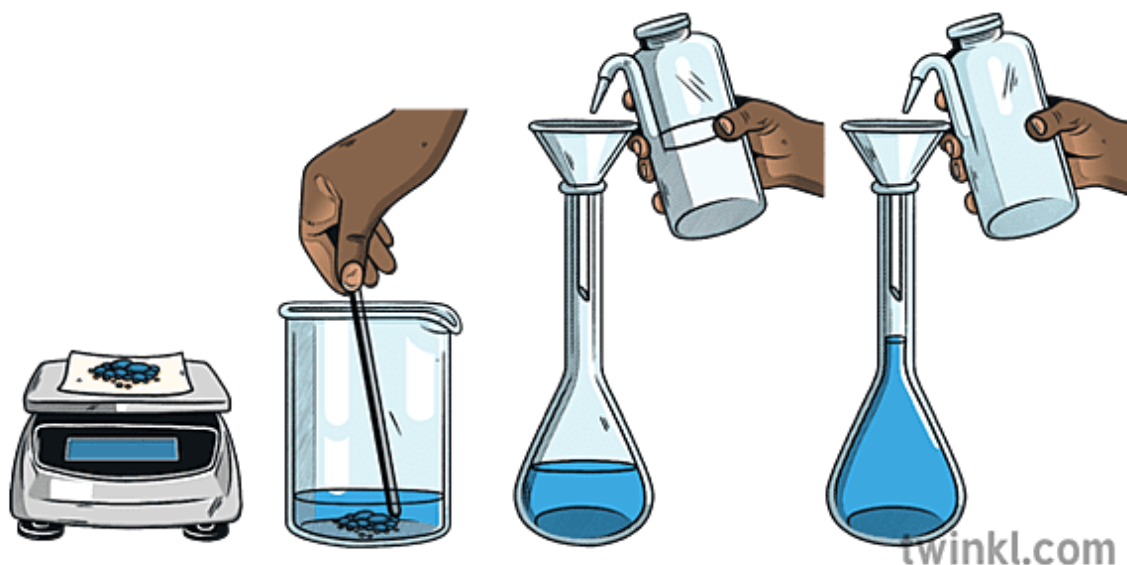
1. Must have high purity.
2. Should not absorb moisture or undergo changes during weighing.
3. Should have a relatively large equivalent weight to minimize weighing errors.
4. Must dissolve easily in water under the given conditions.
5. Should be stable and unaffected by light, temperature, dust, or organic matter.



Practical Part:

- **Preparing a Standard Solution for a Solid Substance:**

1. Accurately weigh the required amount (wt) of the solid substance using a clean, dry beaker.
2. Dissolve the substance in the smallest possible amount of solvent (usually distilled or regular water).
3. Transfer the solution completely to a clean volumetric flask (flask.vol) of the calculated volume.
4. Add distilled water to the flask until it reaches the marked line.



Calculations:

Calculating the Weight of the Solid Substance

$$M = (wt / M.wt) \times (1000 / V \text{ ml})$$

Example: Prepare a standard solution of potassium hydroxide (KOH) with a concentration of 0.01 M and a volume of 100 ml, knowing that the molecular weight is 56 g/mol.

Solution:

$$M = wt / M.wt \times 1000 / V \text{ ml}$$

$$0.01 = wt / 56 \times 1000 / 100$$

$$Wt = 0.056 \text{ g}$$

