



Practical General Chemistry

Lecture notes

Medical laboratory Techniques Department

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First year students

Five Lecture: Preparation Solution from Liquid

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Preparing a Standard Solution from a Liquid (Diluting a Solution of Known Concentration)

Dilution is the addition of more solvent to produce a solution of reduced concentration. Most often a diluted solution is created from a small volume of a more concentrated stock solution. To make such a solution, a volumetric pipet is used to deliver an exact amount of the stock solution into a clean vol flask, which is then diluted to volume. To prevent extra dilution or contamination, prerinse the vol pipet with the stock solution to remove any water droplets or impurities

Caution

This procedure is reversed if the addition of the concentrated solution to solvent causes heating (an exothermic reaction). A notable example is the dilution of a concentrated acid. **NEVER** add water to concentrated acid. The reaction is very exothermic, heating the solution and potentially causing splattering. Always add the concentrated acid to water slowly with stirring. Place the beaker or flask in an ice bath to help cool the resulting solution and prevent splattering.



Glassware

- Pipette
- Volumetric flask
- Graduated cylinder
- Beaker
- Funnel
- Washing bottle

Chemicals

Sulfuric acid H_2SO_4 to prepare 2N in 250ml of D.W.

Procedure

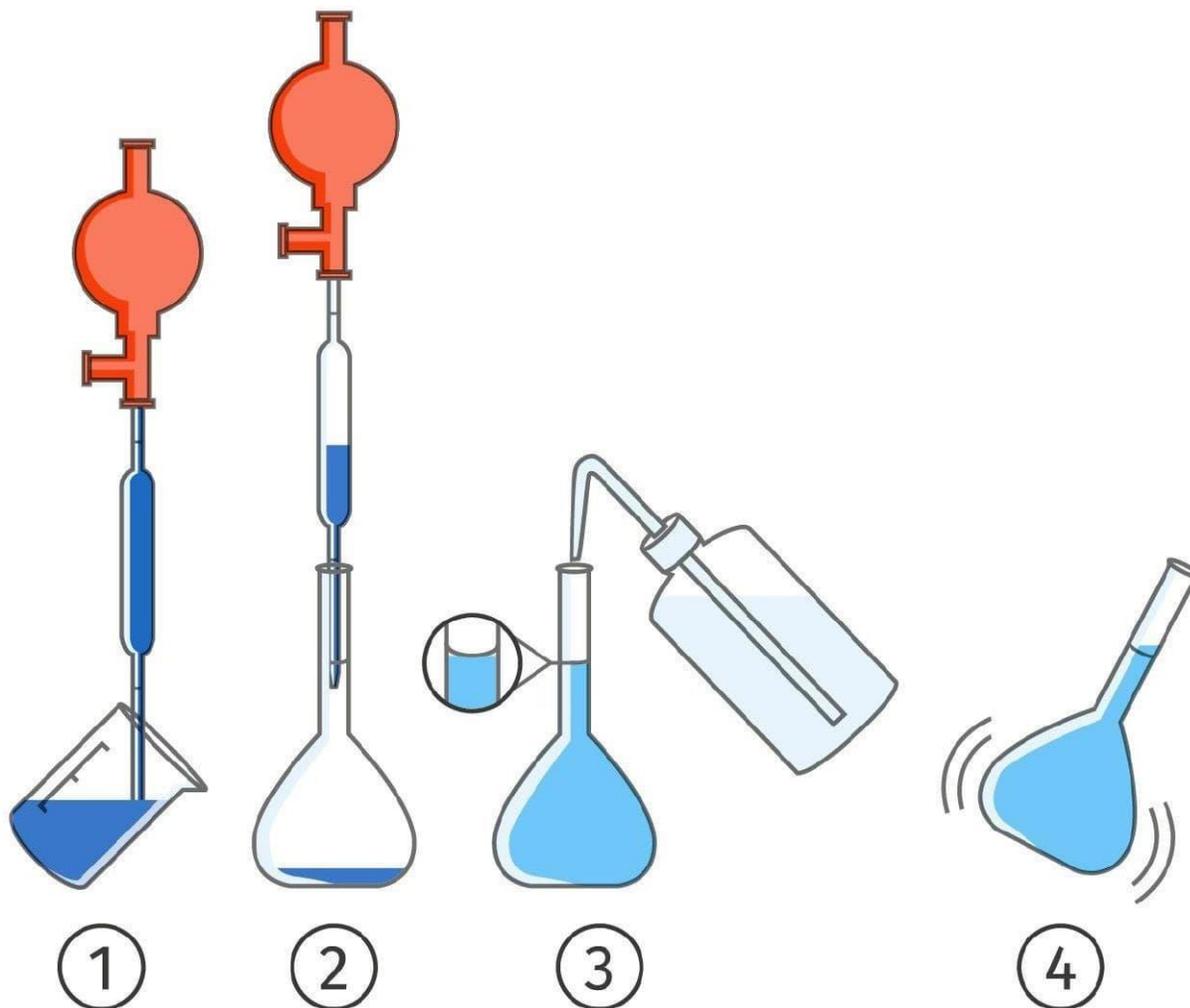
1. Use a pipette to take an exact amount from the stock solution(concentrated) into a clean volumetric flask.
2. Put a funnel into the slim neck of the volumetric flask.
3. Add the solvent until the liquid level reaches to the mark on the neck.

$$N = \frac{\% \times sp. gm \times 1000}{Eq. wt}$$

$$N_1 V_{1(Conc)} = N_2 V_2$$



Standard result: 13.62 ml of H_2SO_4 conc. in 250 ml D.W.





Discussion

Standard (stock) solutions: Solutions with accurately known concentrations.

There are two types of standard solution: **primary** and **secondary** standard solution. Standard Solution can be prepared by two ways:

1. Solids added to liquids
2. Liquids added to liquids

The preparing a standard solution must be accurate when using of balance because the increasing or decreasing of materials result wrong concentration and so for liquids materials when using increasing or decreasing of volume of solution.