Preparing standard solutions

1a Direct weighing method

REQUIREMENTS FOR PRIMARY STANDARD

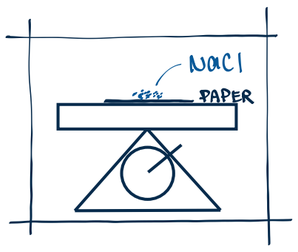
- Soluble in water
- X react w/ air
- X hygroscopic
- non-volatile
- non-toxic

cannot be performed for →

$I_{2(s)}$	volatile → sublimes
$KMnO_{4(s)}$	strong OA, reactive
$NaOH_{(s)}$	neutralises by reacting w/ CO_2 hygroscopic

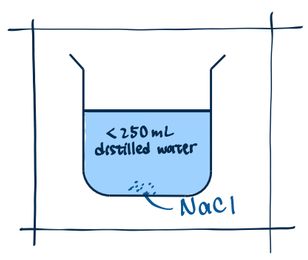
STEPS

- Eg. prepare 0.1M NaCl solution



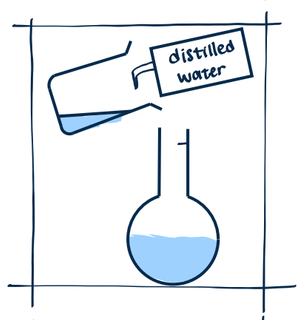
molarity · volume = mole $0.1 \cdot 0.25 = 0.025$ mol (→ volumetric flask capacity)
mole · Mr = mass $0.025 \times (23.1 + 35.5) = 1.465$ g (→ Na, → Cl)

Weigh 1.465g of solid accurately w/ electronic balance



Dissolve $NaCl_{(s)}$ in water completely.
(如果溶不到用 stirrer / 加热)

为啥不直接倒进 volumetric flask 里?
- flask 的开口太小, NaCl 会粘在开口上
- 倒进 flask 以后很难让不是 very soluble 的物质溶在水里

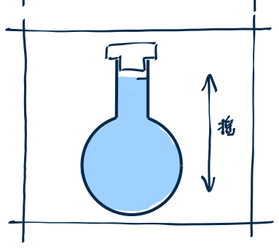


Pour solution in beaker to the volumetric flask.

Rinse the beaker w/ distilled water.

Transfer all the washings to the volumetric flask.

避免还有 NaCl 遗在了 beaker 里



Add distilled water to volumetric flask until it reaches 250 cm^3 graduation mark. Add a stopper then Shake well to dissolve.

1b Other method (未教).

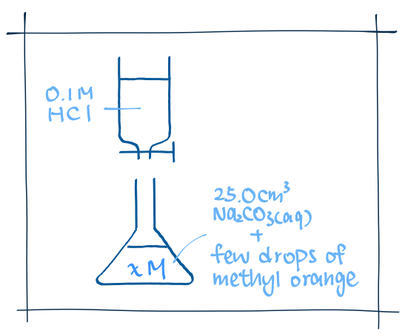
2 Double standardisation

OBJECTIVES & METHOD

- find actual concentration of std. sol^n
- eg. After weighing, some Na_2CO_3 reacts w/ CO_2.
  ↳ molarity of resultant sol^n will be smaller than original.
- find by titrating against other std. sol^n.

STEPS

- eg. prepared 1.0M Na_2CO_3 solution → titrate against standard 1.0M HCl



used avg. of 48.6 cm^3 1.0M HCl to change colour (red → orange)

$HCl : Na_2CO_3 = 2 : 1$

$0.1 \times 0.0495 : x \times 0.025 = 2 : 1$

$x = 0.0972$