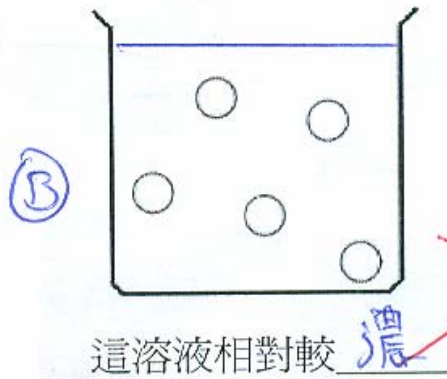
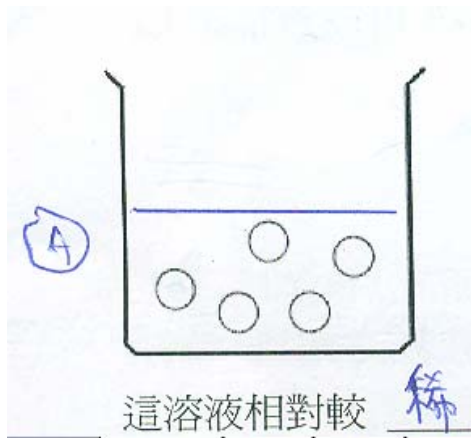
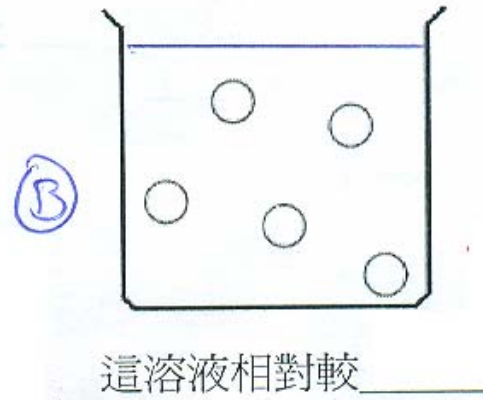
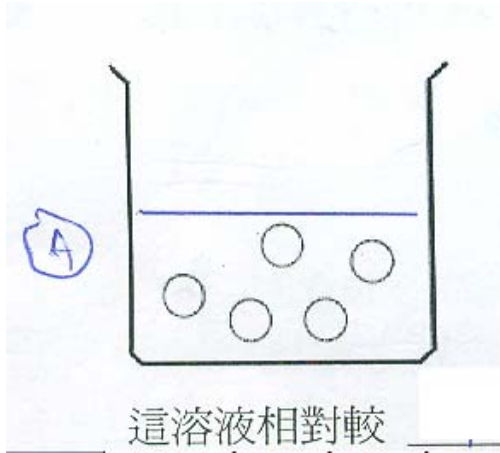


圖解概念

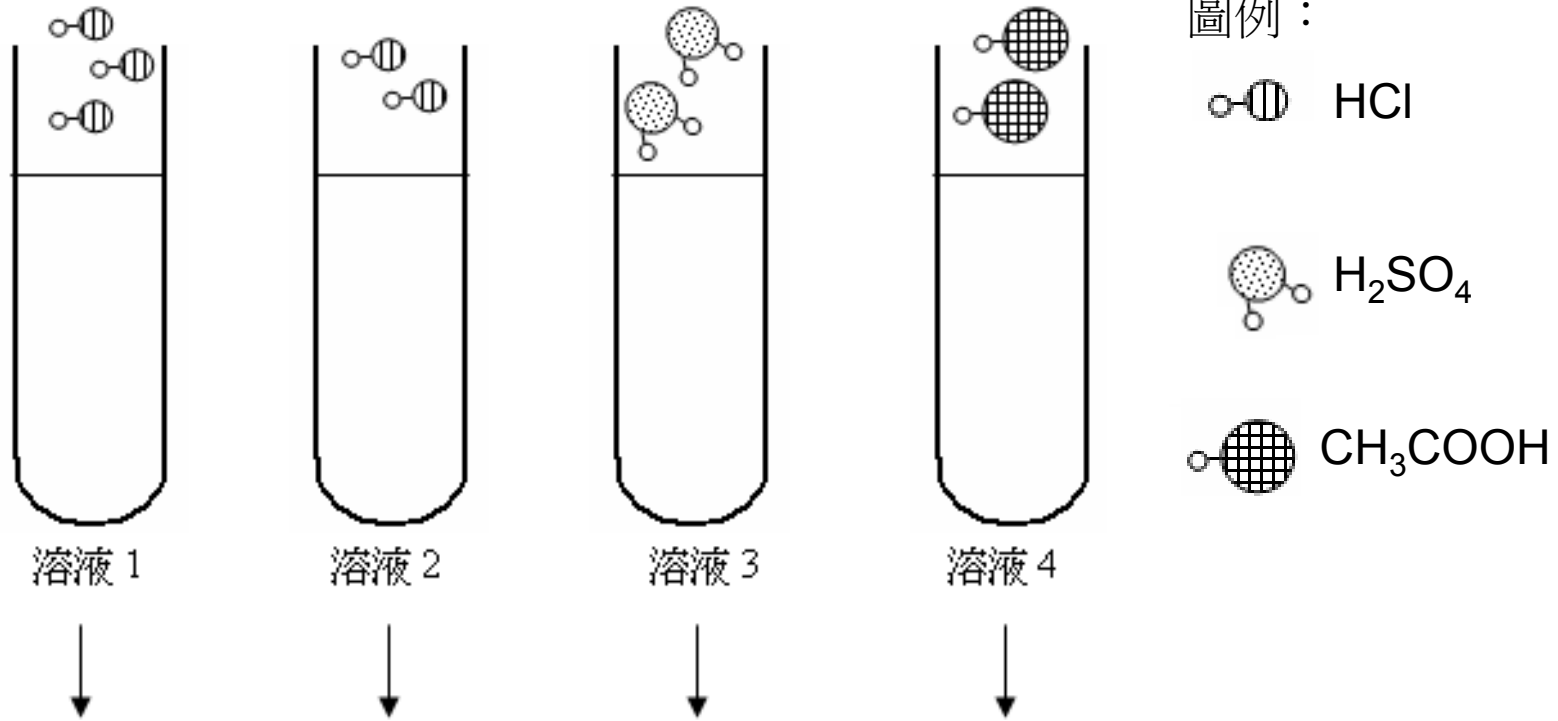
- 利用圖像代表不同的酸分子
- 評估學生對概念的掌握
- 識別錯誤概念 / 學生的學習難點
- 微觀世界 \Leftrightarrow 符號世界

溶劑體積如何影響濃度

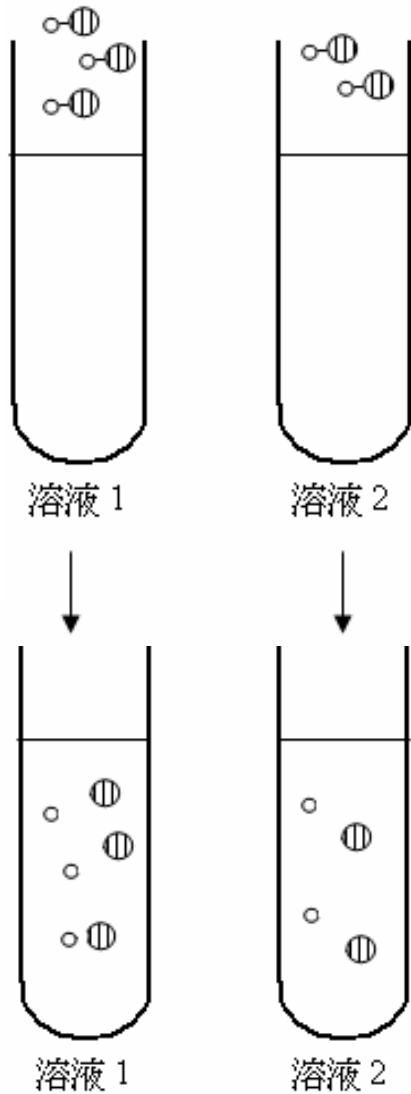


溶液
因為 ② 的體積比 ① 高，而其中含有相同份量的溶質中，② 的濃度比 ① 高。

以圖表達酸溶液



酸溶液1和2

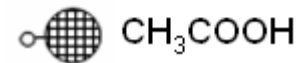
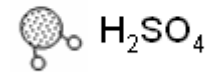


考慮：

1. 該酸分子溶於水後生成什麼
2. 該酸能否完全電離



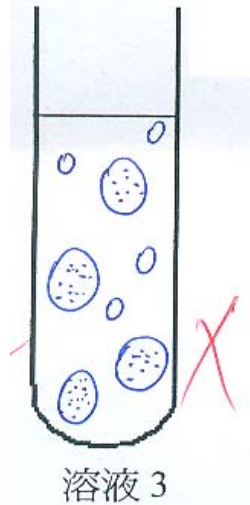
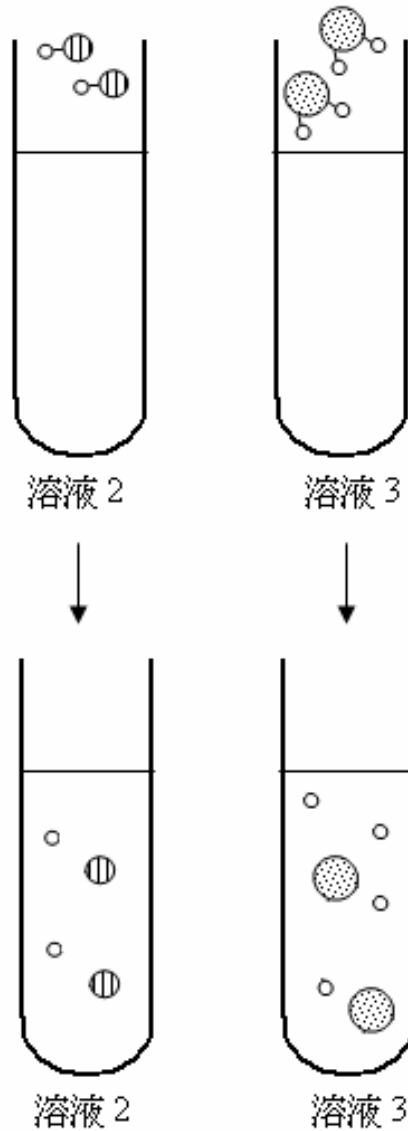
圖例：



酸溶液2和3

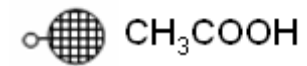
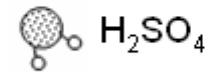
考慮：

1. 該酸分子溶於水後生成什麼
2. 該酸能否完全電離
3. 酸的鹽基度



粒子比例不符

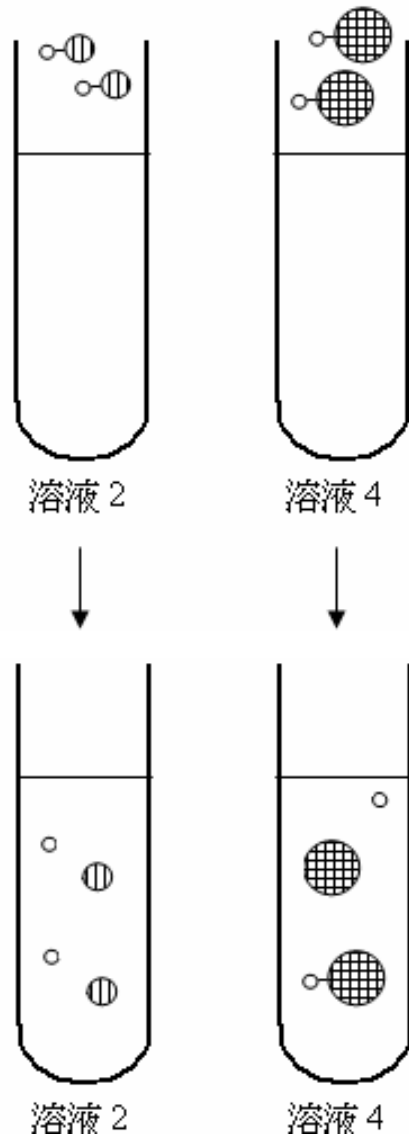
圖例：



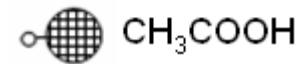
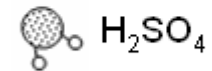
酸溶液2和4

考慮：

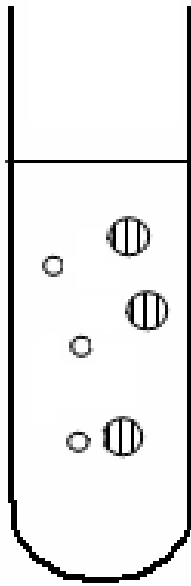
1. 該酸分子溶於水後生成什麼
2. 該酸能否完全電離
3. 酸的鹽基度



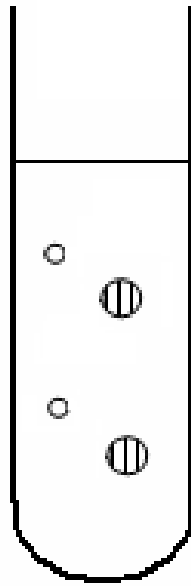
圖例：



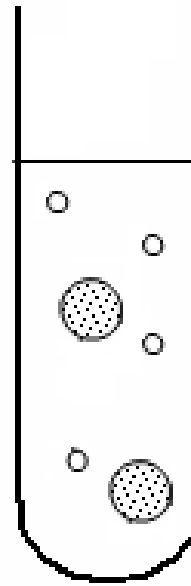
以圖表達酸溶液



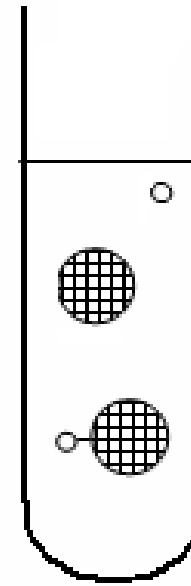
溶液 1



溶液 2



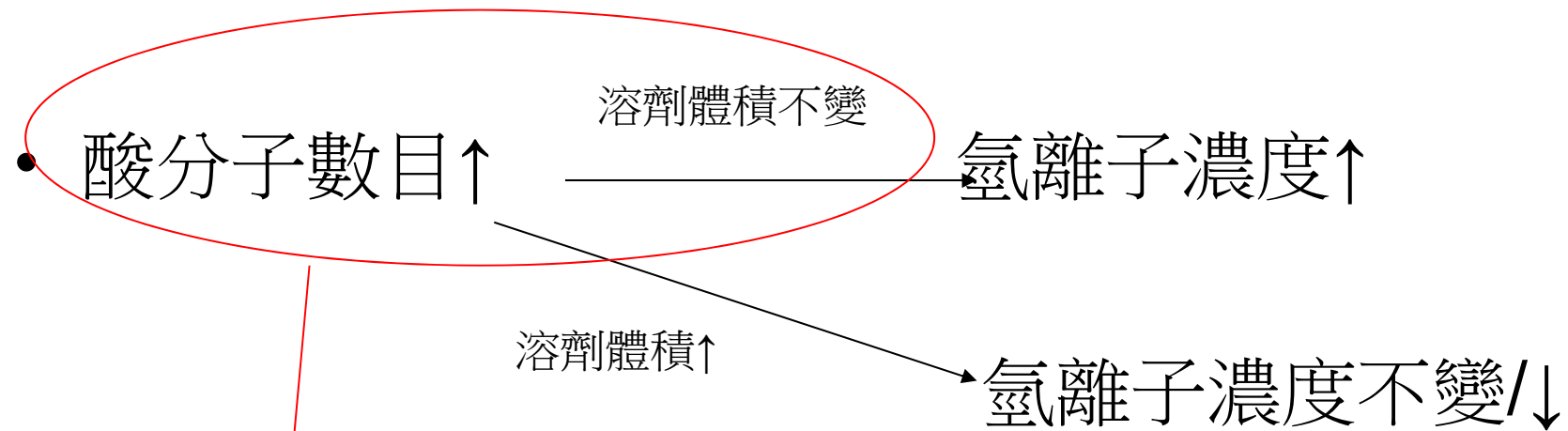
溶液 3



溶液 4

酸溶液的濃度 \neq 酸分子數目

- 酸分子數目 \uparrow ，氫離子數目便會 \uparrow

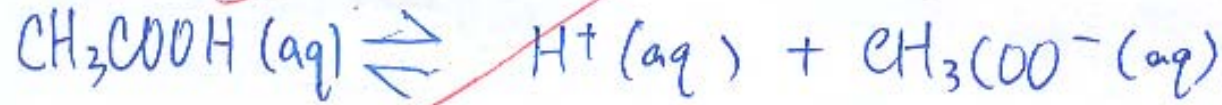


即酸 溶液濃度 \uparrow ， \therefore 氫離子濃度 \uparrow

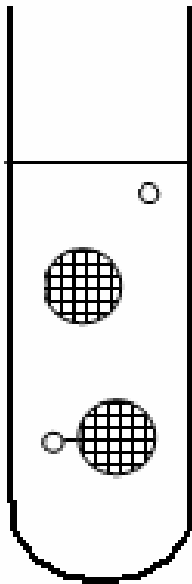
酸分子是否完全電離

離子濃度與溶液濃度是否相同?

(f) CH_3COOH



~~是~~



溶液 4

溶液濃度與成分離子濃度的關係

- 溶液可指任何溶液！
- 1. 溶質與其成分離子的比例是否1:1
 - 是 → 相同 $1 \text{ NaCl(aq)} \rightarrow 1 \text{ Na}^+(\text{aq}) + 1 \text{ Cl}^-(\text{aq})$
 - 不是 → 不相同 $\text{CaCl}_2(\text{aq}) \rightarrow \text{Ca}^{2+}(\text{aq}) + 2 \text{ Cl}^-(\text{aq})$
- 2. 溶於水的分子是否完全電離

Maurice <mwcheng@hku.hk>

- 加入圖像以解釋概念
- 粒子學說的延續
- 使用不同圖像表達概念的好處與限制
- 作為評估學習的工具