

第 7 題

A solution contains the ions Ag^+ , Pb^{2+} , and Ni^{2+} . Dilute solutions of NaCl , Na_2SO_4 , and Na_2S are available to separate the positive ions from each other. In order to effect separation, the solutions should be added in which order?

- (A) Na_2S , NaCl , Na_2SO_4 (B) Na_2SO_4 , NaCl , Na_2S (C) Na_2SO_4 , Na_2S , NaCl (D) NaCl , Na_2S , Na_2SO_4 (E) NaCl , Na_2SO_4 , Na_2S

2.

A solution contains the ions Ag^+ , Ba^{2+} , and Ni^{2+} . Dilute solutions of NaCl , Na_2SO_4 , and Na_2S are available to separate the positive ion from each other. In order to effect separation, the solutions should be added in which order?

- (A) Na_2S , NaCl , Na_2SO_4 (B) Na_2SO_4 , NaCl , Na_2S (C) Na_2SO_4 , Na_2S , NaCl
(D) NaCl , Na_2S , Na_2SO_4 (E) NaCl , Na_2SO_4 , Na_2S

【106 後西】

ANS: (B), (E), (D)

先加 $\text{S}^{2-} \rightarrow \text{Ag}^+$, Ni^{2+} 沈澱 \rightarrow (A) 失敗

先加 $\text{SO}_4^{2-} \rightarrow \text{BaSO}_4$ 沈澱(其實 Ag_2SO_4 也會沈澱, 但溶解度較高); 再加 $\text{Cl}^- \rightarrow \text{AgCl}$ 沈澱; 再加 $\text{S}^{2-} \rightarrow \text{NiS}$ 沈澱 \rightarrow (B) 成功

先加 $\text{SO}_4^{2-} \rightarrow \text{BaSO}_4$ 沈澱; 再 $\text{S}^{2-} \rightarrow \text{Ag}_2\text{S}$, NiS 沈澱, (C) 失敗

先加 $\text{Cl}^- \rightarrow \text{AgCl}$ 沈澱; 再 $\text{S}^{2-} \rightarrow \text{NiS}$ 沈澱, 再 $\text{SO}_4^{2-} \rightarrow \text{BaSO}_4$ 沈澱, (D) 成功

先加 $\text{Cl}^- \rightarrow \text{AgCl}$ 沈澱; 再加 $\text{SO}_4^{2-} \rightarrow \text{BaSO}_4$ 沈澱; 再加 $\text{S}^{2-} \rightarrow \text{NiS}$ 沈澱 \rightarrow (E) 成功

出處: 普化第四部, 溶解度法則

本題其實 Ag_2SO_4 也會沈澱! 但很多 test bank 都認為 Ag_2SO_4 微溶不算沈澱是有爭議的題目, 本題被申訴。

普化第四冊, p175