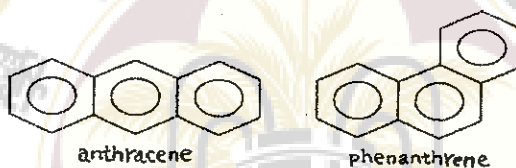


1. 水庫、湖泊優養化，藻類滋生對於水質將會有什麼影響? (20%)
2. 灌溉水中有鎘與鉛的汙染，但是灌溉這種汙水的水稻穗中，經常查不到鎘與鉛，理由何在? (20%)
3. Consider water in equilibrium with solid calcium sulfate,  $\text{CaSO}_4$ , for which  $K_{sp} = 3.6 \times 10^{-5}$  at  $25^\circ\text{C}$ . Calculate the solubility, in g/L, of calcium sulfate in water, assuming that other reactions are negligible. (Atomic weight: Ca=40; S=32; O=16) (10%)
4. For HCN in water,  $K_a = 6.0 \times 10^{-10}$ . Calculate the fraction of cyanide that exists as the anion rather than in the molecular form at pH values of 4 and 10. (10%)
5. Explain why the usage of organochlorine insecticides caused an environmental concern? (10%)
6. For PAHs shown below, would you expect anthracene or phenanthrene to be a carcinogen? Explain your reason? (10%)



7. Describe the phenomenon of the Antarctic ozone hole. Why does it pose a significant threat to human health and the environment? (10%)
8. Convert a concentration of  $1.2 \times 10^{15}$  molecules/ $\text{cm}^3$  of  $\text{CO}_2$  to the
  - (1) ppm scale (5%)
  - (2) moles per liter (molarity) scale (5%)Assume  $25^\circ\text{C}$  and 1.0 atm total air pressure. (The gas constant  $R = 0.082 \text{ L atm/mol K}$ ;  $0^\circ\text{C}$  is about 273  $^\circ\text{K}$ ; the Avogadro's number is  $6.02 \times 10^{23}$ ).

試題隨卷繳回