

Q6 Solutions and solubility

[3 + 2 + 2 = 7 marks]

- a) Calcium oxalate is the major source of kidney stones.
If the solubility product, K_{sp} , of calcium oxalate, CaC_2O_4 , in water at 25 °C is 2.32×10^{-9} ,
calculate the molar solubility of calcium oxalate and the solubility in g L^{-1} at this temperature.

Hint: M_r for $\text{CaC}_2\text{O}_4 = 128.097 \text{ g mol}^{-1}$.

[3 marks]

- b) Explain why the colligative properties of solutions of ionic compounds are more pronounced than the colligative properties of solutions of molecular compounds.

[2 marks]

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Q6 (continued) Solutions and solubility

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- c) Calculate the mass of glucose, $C_6H_{12}O_6$, (a sugar found in many foods) which would have to be dissolved in 500 g of water to give a solution of molality $0.133 \text{ mol kg}^{-1}$.

Data: $M_r C_6H_{12}O_6 = 180.156 \text{ g mol}^{-1}$

$M_r H_2O = 18.015 \text{ g mol}^{-1}$

[2 marks]