

Lecture VI

PROBLEM 1

Estimate the time to reach the 90% of surface coverage in a process following the Langmuir anchoring, for the adsorption of human serum albumin on hydroxyapatite. From recent literature we can find a value for the adsorption rate as $R_A = 61.34 \cdot 10^{-5} s^{-1}$.

PROBLEM 2

Estimate the time to reach the 50% and the 90% of surface coverage for the adsorption of human serum albumin on hydroxyapatite, by using the Kisliuk model. Consider a sticking coefficient $k_s = 0.6$. From recent literature we can find a value for the adsorption rate as $R_A = 61.34 \cdot 10^{-5} s^{-1}$.

PROBLEM 3

Estimate the concentration of two molecules adsorbing on the same surface, at equilibrium. Consider as adsorption rate $R_{A1} = 50.3 \cdot 10^{-5} s^{-1}$, and $R_{A2} = 92.1 \cdot 10^{-6} s^{-1}$ and the constant $\alpha = 1.16$, $\beta = 1.36$.

PROBLEM 4

If we have a large protein complex (20 nm in size) with a rigid globular structure presenting many anchoring points onto the surface, and if the immobilizing area is covered by packed thiols spaced of 2nm each others presenting an anchoring group each, In your opinion, which model is better to describe the adsorption mechanism? Why?