Ligand binding in crowded polymers

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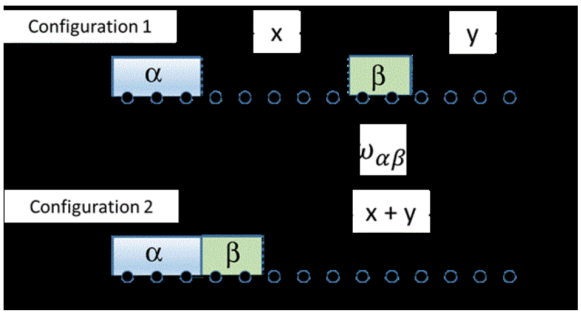
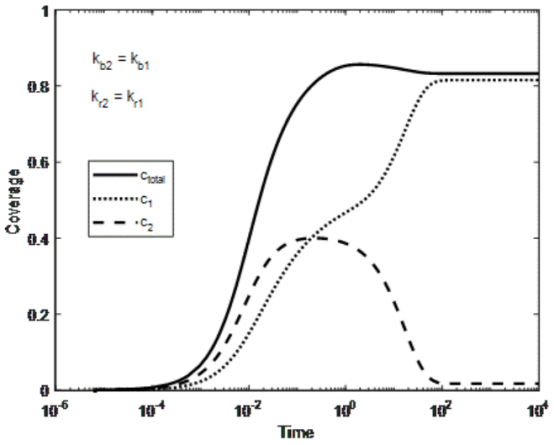
Ligands change or modulate the physical and chemical properties of the bounded polymers. Ligand biding depends on the availability of the required binding sites. This feature greatly conditions the binding kinetics and the final coverage.

Here, we review the effective evolution equations for ligand binding coverage we have developed [1,3,4,5] and their comparison to experimental results [2,4].

The binding possibilities were computed generalizing the Mc Ghee – von Hippel counting methods. This procedure was shown to provide a result equivalent to the Tonks gas model.

The results show that ligand binding to multiple sites do not usually fully cover the polymer. Because the random binding leaves gaps that are too short for a new ligand binding. The ligands can bind non-cooperatively, where binding of the individual ligands is independent; or can bind cooperatively, where binding of a ligand to the neighboring is energetically favorable, leading to a more ordered ligand binding. Additionally, competitive ligand binding has illustrated the interactions between ligands of different sizes. It has revealed that small ligands have a strong impact in the inhibition of large ligand binding. Ligand binding size is revealed to have a leading order effect compared to affinity.





Ligand binding competition provides a key insight into a leading mechanisms that inhibits or enhances the presence of a ligand bound to a polymer. Determining the ligand modulation of the physical and chemical properties of the polymer.

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