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Effect of confinement on reaction rates within polymer nanotemplates CECILE MALARDIER-JUGROOT, XIA LI, Royal Military College of Canada — The most efficient catalysts have been developed and optimized by living systems. Indeed, in vivo enzyme-catalyzed reactions are several orders of magnitude more efficient than platinum based catalyzed reactions. However, the rate of reaction and equilibrium interactions are considerably reduced when the biological systems are studied in vitro. This phenomenon is largely attributed to the effect of confinement or macromolecular crowding present in the cell. Confinement can also be observed in an aqueous solution containing surfactants (amphiphilic copolymers). For example, copolymers can self-assemble into well defined ordered structures such as micelles, nanotubes, vesicles; and the geometries and shapes of a given copolymer can be controlled by their solvent affinity. The hollow nanoarchitectures obtained by self-assembly can be used as a model template to study confinement within a soft shell system to mimic biosystems. These systems provide a very controlled environment for the study of confinement. In this paper we will present the effect of confinement on polymerisation reactions combining both simulation and experimental characterisation for a comprehensive study of the effect of confinement on the interactions among confined molecules.

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