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Reaction Engineering: peptide mimetic materials as nano reactor

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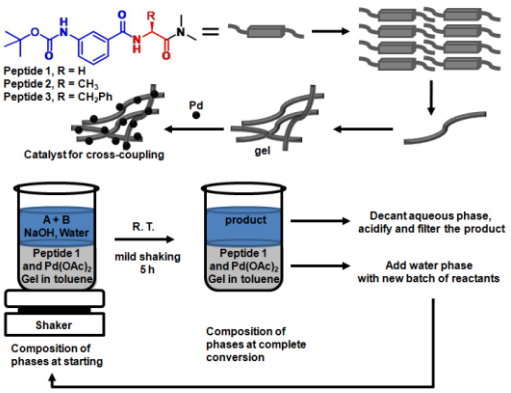
Nature shows excellent selectivity and efficiency within definite compartment. Even the microorganisms are producing thousands of complicated chemicals with extreme selectivity and almost zero chemical waste.[1] Hence, the fabrication of biomimetic supramolecular structures to facilitate organic syntheses in a confinement is highly important for chemical research and industry.[2] Nanoreactors are devices having nanometer size inner channel dimensions and which follow the main features of microreactors such as high surface-area-to-volume ratio. Hence, the outcome of a nanoreactor is higher in comparison to conventional reaction pot.[3] The mixing times (about several milliseconds) in nanoreactors are smaller than those in conventional syntheses and also due to the nanoconfinement the diffusion times are very small. So, the effect of mass transport on the speed of the reaction becomes reduced significantly and catalyses reactions with high selectivity. The very small reaction volume in nanoreactors is also an advantage for technical safety of toxic, explosive and hazardous materials. This presentation mainly focuses on the role of amino acids or small peptides or peptide mimetics as building blocks to develop supramolecular gel as platform for complex organic synthesis (Figure 1). Emphasis will be given on both advantages and limitations. The recent advances and future scope in this area will be discussed briefly.



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