



***Control and Intensification of Mass Transfer and Separation Processes with Smart Materials***

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Control and Intensification of Mass Transfer and Separation Processes with Smart Materials Mass transfer and separation processes are important processes in many industrial fields such as chemical engineering, biomedicine and so on. The regulation and intensification of mass transfer and separation processes play a key role in the transformation of traditional technology and the development of new technology. By introducing the response behaviors of smart materials, it is possible to achieve the environmental regulation and intensification of mass transfer and separation processes, and it is one of the frontiers and hotspots in the interdisciplinary researches of chemical engineering and materials, chemistry, medicine and so on. How to construct novel smart responsive drug delivery systems and membrane separation systems to break through the diffusion theory and enhance the membrane separation processes is still challenging in this field. By designing molecular-level structures and microstructures, we constructed responsive controlled release systems and smart membrane systems with smart materials, and pioneered the development of novel efficient smart membrane separation systems, responsive self-regulatory controlled release drug carriers with novel modes with the assistance of responsive smart materials. Thus, the difficult problems of molecular desorption in affinity membrane separations and the limited mass transfer momentum in carrier systems have successfully solved, and the regulation and intensification of drug separation and mass transfer processes have been achieved. The results provide novel ideas for the innovation of membrane separation systems and the regulation and intensification of mass transfer processes in drug controlled-release systems. With self regulated membrane performances, the smart membranes show great power for global sustainable government