Charge-Selectively Permeable Microcapsules

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Microcapsules with a selectively permeable shell are attractive delivery vehicles, containers for sensing, and micro-reactions. While capsules displaying a size-selective permeability have been frequently reported[1–4], capsules with charge-selectivity are much rarer. Here, we introduce a new type of capsule possessing viscoelastic shells that display a charge-selective permeability. The capsules are composed of chelator-functionalized surfactants that have been crosslinked with appropriate ion clusters. We demonstrate that these capsules can repeatedly uptake and release selected reagents. These capsules have the potential to be used, for example, for wastewater treatment, or as picoliter-sized reaction vessels to selectively conduct chemical reactions only within capsule cores.

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