Janus particle preparation via electrospinning

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Biphasic Janus particles composed of two different polymers can be designed by simultaneous electrospinning utilizing a side-by-side alignment \cite{1}. This process is applicable to a wide range of polymers.

We demonstrate the fabrication of Janus particles composed of polystyrene (PS) and poly(methyl methacrylate) (PMMA) with varying shapes and sizes from 1-3 µm which are tuneable by various parameters. The PS component of the Janus particle shows a darker contrast than the PMMA component and the obtained particles exhibit a nanoporous surface with small pore sizes.

To indicate the biphasic character the particles were irradiated with UV-light to decompose the PMMA component of the Janus particles. After UV irradiation only half sphere-like objects containing the PS remained on the target, giving evidence of the Janus character of the initial particles. This preparation method offers the advantage of designing Janus particles composed of polymers in a larger scale. The resulting particles can be utilized for further modification depending on the desired application in the field of guided self-assembly, molecular imaging or membrane construction.