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Communication

Cable-like Au@SiO_2 Janus composite nanorods

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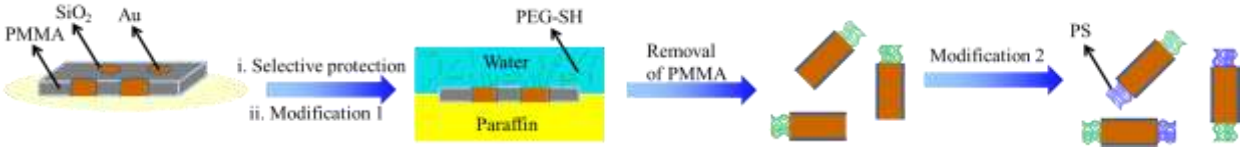
GRAPHICAL ABSTRACT



Cable-like Au@SiO_2 Janus composite nanorods are fabricated by selectively modifying two ends of nanorods which are obtained *via* membrane synthesis and skiving. This method can be easily extended to other systems with varied compositions, deriving a huge family of Janus composite nanorods.

ABSTRACT

Cable-like Au@SiO_2 Janus composite nanorods with PS and PEG grafting on both ends respectively are fabricated by skiving in combination of a post favorable modification. The cable-like Au@SiO_2 composite nanofibers are synthesized in the channel of porous anodic aluminium oxide (AAO) membrane. After skiving, the corresponding composite nanorods are obtained. Following, PEG-SH and PS-SH are conjugated onto the two ends of the nanorods by a selective partial modification, respectively. Length and diameter of the Au@SiO_2 Janus composite nanorods can be tuned controllably. It can be extended to fabricate a variety of different Janus nanorods with different compositions and microstructures.

Keywords:
AAO membrane
Janus
Nanorods
Skiving
Selective modification

Janus materials with two different compositions compartmentalized on the surface of one object, have gained increasing concerns in both academic and industry [1-13]. The asymmetric structure gives Janus materials unique performances, such as amphipathic [14,15], magnetic [16,17] and catalyzed [18-20]. Compared with spherical Janus particles, one-dimensional Janus nanorods, nanofibers and nanotubes are asymmetric in both chemical composition and shape [21-24]. The anisotropic Janus nanorods have been applied in many fields such as catalysis, bionics, drug delivery and advanced materials [25-30]. But for their complex structure, the preparation of Janus nanorods remains a challenge.

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