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らせん配列した炭素ナノ球殻の創製とキラル識別能

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Helically aligned fused carbon hollow nanospheres with chiral discrimination ability

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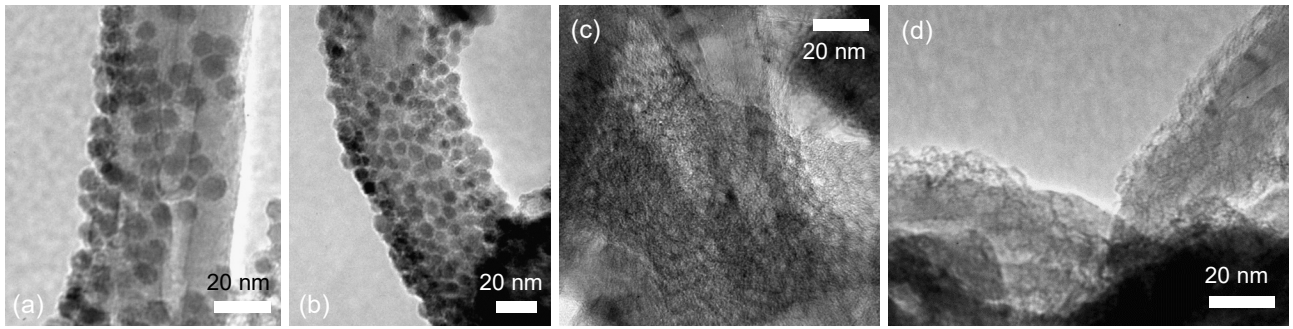

Figure1. Transmission electron microscope images of fused carbon hollow nanospheres containing Fe_3O_4 nanoparticle inside as template and aligned on multi-walled carbon nanotube with helices induced by (a) (*S*)- and (b) (*R*)-binaphthyl derivatives. Removal of Fe_3O_4 by acid treatment of samples (a) and (b) yielded fused carbon hollow nanospheres (c) and (d), respectively.

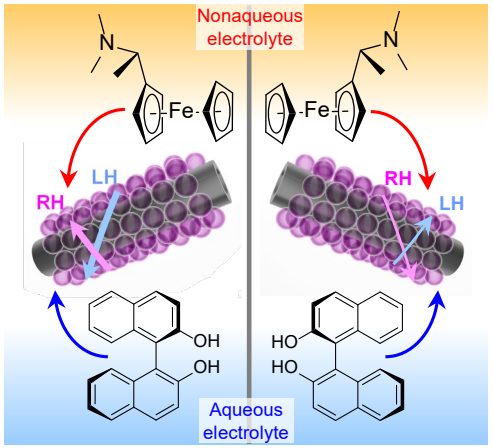

Figure 2. Schematic representation of chiral discrimination.

炭素前駆体とキラル誘起源とともにFe_3O_4ナノ粒子をカーボンナノチューブ状に自己組織化させて熱処理し、酸洗浄すると、お互いに接合して、らせん状に配列した炭素ナノ球殻が得られた。ナノチューブとナノ球殻の間に形成されるキラル空間に起因する新たなキラル認識機構により、光学活性分子の選択的な電気化学反応が起こることが見出された。

Heat treatment of self-assembled Fe_3O_4 nanoparticles with a carbon precursor and a chiral inducer along multiwalled carbon nanotubes, followed by acid treatment, produces helically aligned fused carbon hollow nanospheres. Preferential electrochemical reactions of chiral molecules occur based on a new mechanism of chiral discrimination attributed to chiral spaces generated between the nanotube and nanospheres.