

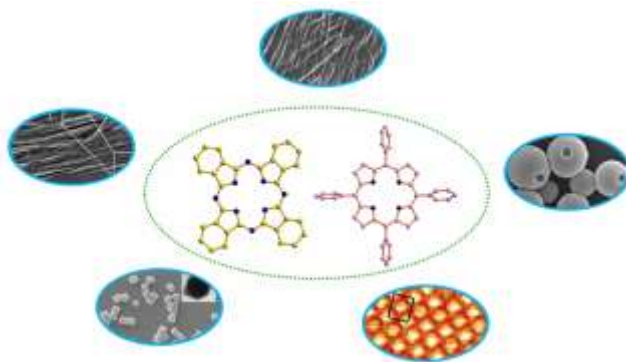
Self-assembled Nanostructures Based on Tetrapyrrole Complexes

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Extended Abstract

Self-assembly of functional molecular materials into well-defined nanostructures has attracted research interests in both material and chemistry fields. Various interactions including π - π interaction, van der Waals, hydrogen bonding, and metal-ligand coordination act as the driving force in the self-assembling process to fabricate ordered nanostructures from the tetrapyrrole complexes, such as nanowires, nanotubes, nanocrystals, nanohollow spheres, and molecular layers. Systematic studies over the formation mechanism of the self-assembled nano-aggregates are helpful for constructing novel functional devices.



References

- Bian Y., Zhang Y., Ou Z., Jiang J. (2011) Chemistry of Sandwich Tetrapyrrole Rare Earth Complexes. Handbook of Porphyrin Science, 14, 249-460.
- Gao Y., Zhang X., Ma C., Li X., Jiang J. (2008) Morphology-Controlled Self-Assembled Nanostructures of 5,15-Di[4-(5-acetylsulfanyl)pentyl]porphyrin Derivatives. Effect of Metal-Ligand Coordination Bonding on Tuning the Intermolecular Interaction. J. Am. Chem. Soc., 130, 17044-17052.
- Jiang J., Ng D. K. P. A. (2009) Decade Journey in the Chemistry of Sandwich-Type Tetrapyrrolo-Rare Earth Complexes. Acc. Chem. Res., 42, 79-88.
- Kan J., Chen Y., Qi D., Liu Y., Jiang J. (2012) High-Performance Air-Stable Ambipolar Organic Field-Effect Transistor Based on Tris(phthalocyaninato) Europium(III). Adv. Mater., 24, 1755-1758.
- Lu G., Chen Y., Zhang Y., Bao M., Bian Y., Li X., Jiang J. (2008) Morphology Controlled Self-Assembled Nanostructures of Sandwich Mixed (Phthalocyaninato)(Porphyrinato) Europium Triple-Deckers. Effect of Hydrogen Bonding on Tuning the Intermolecular Interaction. J. Am. Chem. Soc., 130, 11623-11630.

- Lei S., Deng K., Yang Y.-L., Zeng Q.-D., Wang C., Jiang J. (2008) Electric Driven Molecular Switching of Asymmetric Tris(phthalocyaninato) Lutetium Triple-Decker Complex at the Liquid/Solid Interface. *Nano Letters*, 8, 1836-1843.
- Takami T., Ye T., Pathem B. K., Arnold D. P., Sugiura K., Bian Y., Jiang J., Weiss P. S. (2010) Manipulating Double-Decker Molecules at the Liquid-Solid Interface. *J. Am. Chem. Soc.*, 132, 16460-16466.
- Wang L., Chen Y., Jiang J. (2014) Controlling the growth of porphyrin based nanostructures for tuning third-order NLO properties. *Nanoscale*, 6, 1871-1878.
- Yoshimoto S., Sawaguchi T., Su W., Jiang J., Kobayashi N. (2007) Superstructure Formation and Rearrangement in the Adlayer of a Rare-Earth-Metal Triple-Decker Sandwich Complex at the Electrochemical Interface. *Angew. Chem., Int. Ed.*, 46, 1071-1074.
- Ye T., Takami T., Wang R., Jiang J., Weiss P. S. (2006) Tuning Interactions between Ligands in Self-Assembled Double-Decker Phthalocyanine Arrays. *J. Am. Chem. Soc.*, 128, 10984-10985.