オール有機の蛍光美粒子

高分散性・高安定性・高機能性！

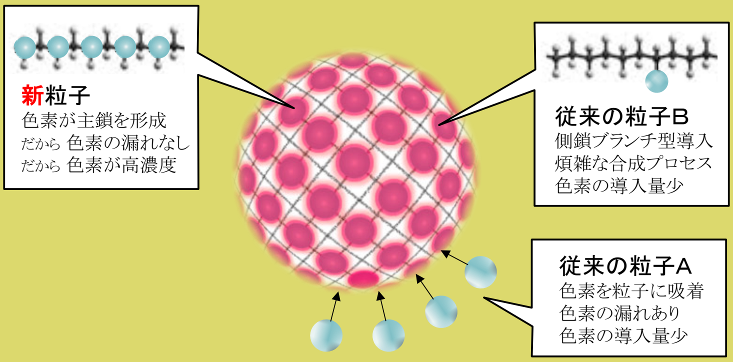
Innovation

◆ 色素からなる微粒子
　だから 安定・色素漏れなし

◆ 構造がシンプル
　だから 酸・アルカリに強い

◆ 水にも有機溶媒にも
　ソープフリーで分散可能

◆ ナノからマイクロサイズまで

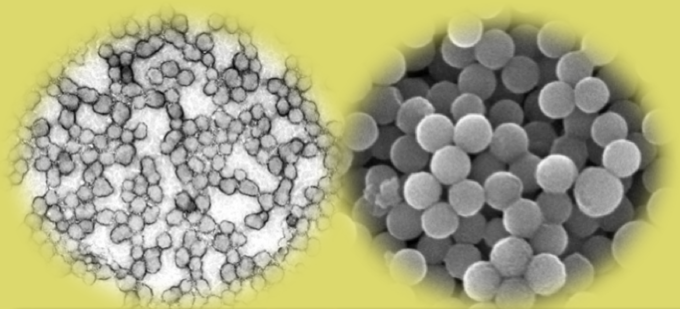


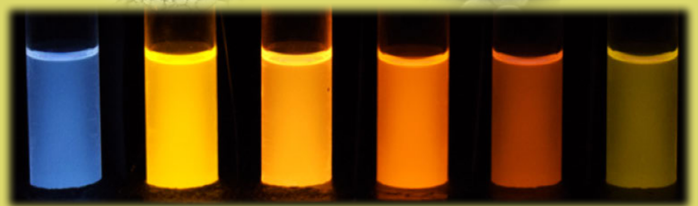
Versatile Emission

◆ 有機系ならではの
　ブロードバンド発光

◆ オール有機粒子だから
　ポリマー材との相溶性抜群

◆ 蛍光ソルバトクロミズムによる
　多彩な発光色

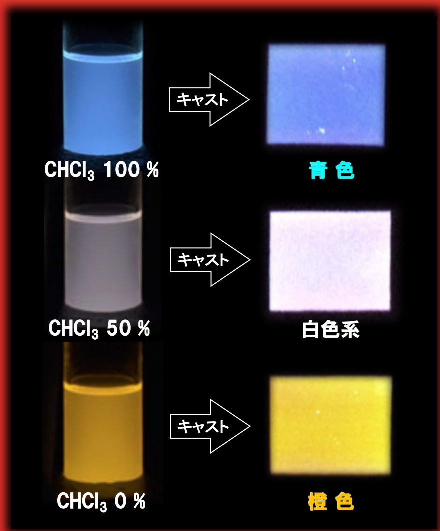




Various Applications

高い分散性が生み出す多彩な展開力

発光性フィラー　発光性トナー
発光性中間膜　波長変換フィルム
バイオイメージング　蛍光センシング
蛍光ラベリング



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CHEMISTRY
A European Journal

A Journal of
ChemPubSoc Europe

Accepted Article

Title: Emission color control in polymer film by memorized fluorescence solvatochromism due to a new class of totally-organic fluorescent nanogel particles

Authors: Nobuo Yamada, Hiroki Noguchi, Yoshifumi Orimoto, Yutaka Kuwahara, Makoto Takafuji, Shaheen Pathan, Reiko Oda, Almara Mahammadali Rahimli, Mahammadali Ramazanov, and Hirotaka Ihara

This manuscript has been accepted after peer review and appears as an Accepted Article online prior to editing, proofing, and formal publication of the final Version of Record (VoR). This work is currently citable by using the Digital Object Identifier (DOI) given below. The VoR will be published online in Early View as soon as possible and may be different to this Accepted Article as a result of editing. Readers should obtain the VoR from the journal website shown below when it is published to ensure accuracy of information. The authors are responsible for the content of this Accepted Article.

To be cited as: *Chem. Eur. J.* 10.1002/chem.201901239

Link to VoR: http://dx.doi.org/10.1002/chem.201901239

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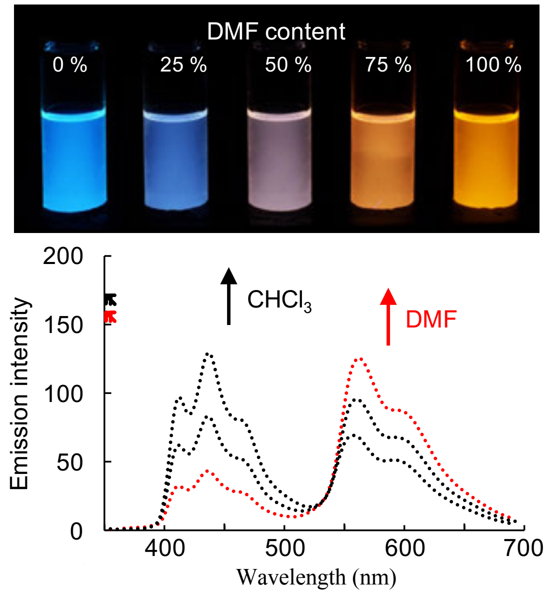

Figure 5. Fluorescent emission spectra and luminescence color of Ant10-T_8W_2 in $CHCl_3$ and DMF mixture.

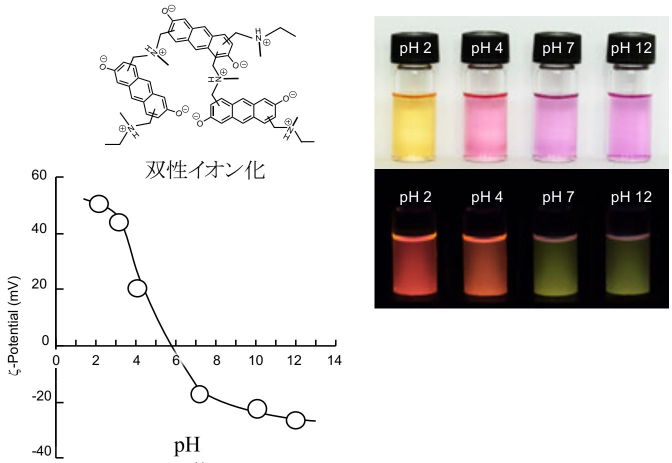

Figure 2. pH dependency of Ant10-T_8W_2 particles dispersed in an aqueous solution (5 mg L^{-1}). (a) Under normal light, (b) excited at 365 nm.

Chemistry Letters

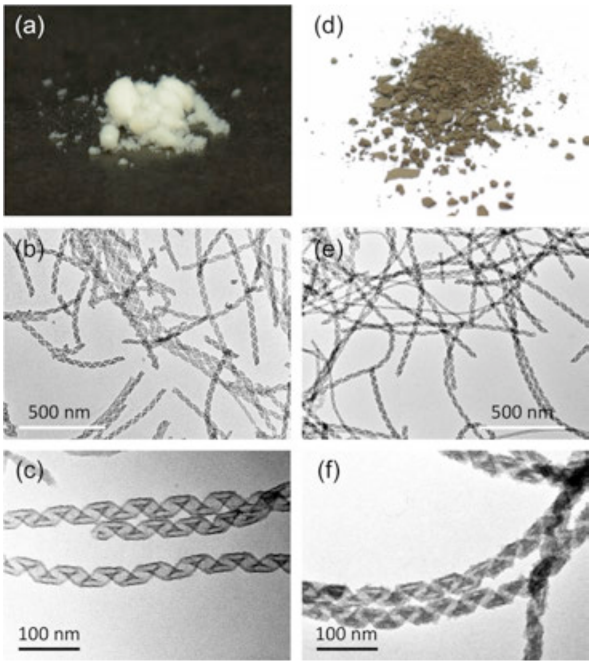

Figure 2. (a) White powders from bare silica helices and (b-c) their TEM images. (d) Brownish greenish powders from the polymer-deposited silica helices and (e-f) their TEM images.

Fabrication of fluorescent one-dimensional-nanocomposites through one-pot self-assembling polymerization on nano-helical silica

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This paper presents a new class of one-dimensional nanostructures exhibiting remarkable fluorescent solvatochromism. This is fabricated through the self-assembling polymerization of 2,6-dihydroxyanthracene with a small crosslinker on the surface of silica helices obtained from a sol-gel reaction with tetraethoxysilane in the presence of the gemini surfactant-derived chiral assembly.

Keywords: Fluorescent solvatochromism, Helical self-assembly, Nanocomposite

One-dimensional (1D) nanomaterials have received significant attention owing to their peculiar dimensional restriction, physicochemical and optical properties, and various applications such as in optoelectronic devices,[1] photovoltaics,[2] solar cells,[3] and photonics.[4] Such 1D nanomaterials have been provided as helical self-assemblies,[5,6] nanofibers,[7] nanorods,[8] and nanotubes[9] and, therefore, they have frequently been fabricated using a bottom-up approach based on a self-assembling technique such as supramolecular chiral self-assembly,[10-12] polymer electrospinning,[13] and block building through crystallization.[14] Owing to their enhanced features such as a high specific surface area, mechanical properties, and chiral optical properties, they play an important role in a wide range of applications.[15] The most challenging aspect is to introduce optical properties into these 1D nanostructures, one of the most convenient methodologies of which can be consolidated through a fabrication using the adsorption or grafting of fluorescent components such as organic dyes[16] and quantum dots[17] on the surfaces. However, these types of fluorescent 1D nanomaterials still face certain problems, such as a lack of stability from an elution or a disassociation, and quenching from a highly dense immobilization, among others. To overcome these problems, some better systems should be newly developed.

In this paper, we introduce a new and facile approach (Figure 1) for the creation of fluorescent 1D nanomaterials based on fluorescent polymer-deposition through their direct polymerization, which may overcome the limitation of quenching and a loss in photochemical properties. Other advantages include the use of an organic monomer, absence of heavy metals, and good solubility in various solvents.

In this study, we selected twisted nanoribbons as the 1D nanomaterials, which were delivered from a simple combination of a non-chiral gemini surfactant and chiral tartrate anion (16-2-16 aggregates, as shown in Figure 1A) because this new class of 1D nanomaterial demonstrates distinct advantages in well-controlled helical structures in