シード分散重合による金ナノ粒子導入液晶高分子微粒子の創製

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Liquid-Crystalline Polymer Particles Containing Gold Nanoparticles via Seeded Dispersion Polymerization ([1]*Ritsumeikan University*) ○Kei Nomura,[1] Kohsuke Matsumoto,[1] Osamu Tsutsumi[1]

Organic-inorganic hybrid materials combine the distinct advantages of both organic and inorganic components. Previously, we demonstrated the synthesis of monodisperse liquid-crystalline polymer microparticles with controlled molecular orientation via dispersion polymerization.[1,2)] In this study, we synthesized liquid-crystalline polymer microparticles containing gold nanoparticles through seeded dispersion polymerization. UV-vis spectroscopy of the obtained particle's solution confirmed the absorption based on surface plasmon resonance from gold nanoparticles, which indicates the successful incorporation of gold nanoparticles into the liquid-crystalline polymer microparticles.
Keywords : Liquid-Crystalline Polymer Particles; Organic-Inorganic Hybrid Materials; Seeded Dispersion Polymerization

有機・無機ハイブリッド材料は，有機と無機のそれぞれの特徴をあわせもつ材料である。これまでにわれわれは，分散重合により，粒径と分子配向が制御された単分散液晶高分子微粒子を合成できることを見出した[1,2)]。本研究では，シード分散重合によって，金ナノ粒子を導入した液晶高分子微粒子の合成を行った。金ナノ粒子の表面プラズモン共鳴を用いた分光分析により，金ナノ粒子を内包した液晶高分子微粒子が合成できたことがわかった(Figure 1)。また，偏光顕微鏡結果から，金ナノ粒子の導入によって液晶の分子配向は変化せず，双極型配向を示すことがわかった(Figure 2)。

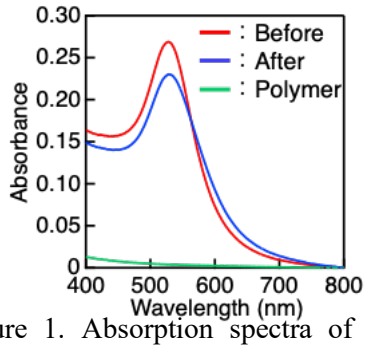

Figure 1. Absorption spectra of THF solutions containing gold nanoparticle (red), liquid-crystalline polymer particles with gold core (blue), and those gold core (green).

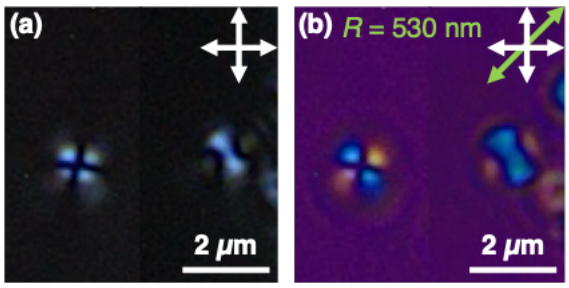

Figure 2. Polarized optical micrographs of particles without (a) and with (b) a retardation plate (R = 530 nm) under crossed nicol. Green arrows show the optic axis of a retardation plate (Scale bar = 2 μm).

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2) T. Shigeyama, *et.al.*, *Molecules* **2023**, *28*, 7779.