

Development of high-performance color material with organo-catalyzed controlled polymerization

[Project Leader Institution] **Dainichiseika Color & Chemicals Mfg. Co., Ltd.**

[Principal Investigator] **Prof. A. Goto, Institute for Chemical Research, Kyoto University**

<Key Words>

Organic catalysts, Controlled polymerization, Living radical polymerization, Color materials, Fine dispersion, Nanoparticles, Pigments, Polymer dispersants, Functional polymer materials

[Abstract] Living radical polymerization using organic catalysts (organo-catalyzed controlled polymerization (OCCP)) has been explored as a low-cost manufacturing method for various functional polymers (FIG 1). The block polymers made by OCCP are innovative polymer dispersants which can finely disperse extremely aggregative nanoparticles such as pigments in liquids and resins. Such dispersants and dispersions find a wide variety of industrial applications (FIG 2). We have successfully installed a pilot plant suitable for OCCP and demonstrated polymer production in a manufacture scale (FIG. 3). Upon designing polymer structures according to products, dispersions of nanoparticles in liquids have been commercialized.

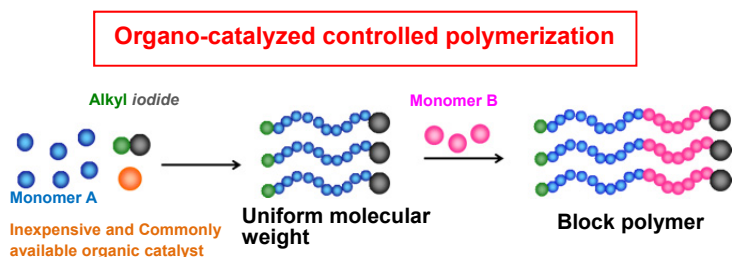


FIG 1

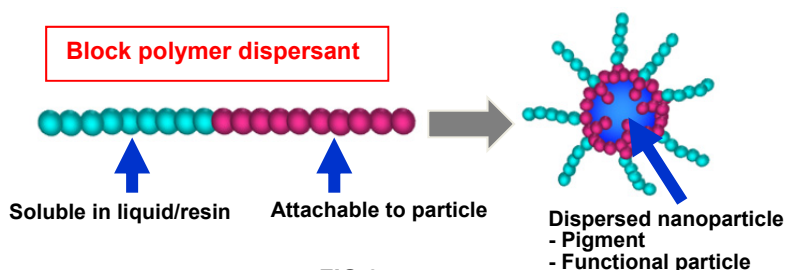


FIG 2



FIG 3

Expected Impact (significance, market size, and forecast)

OCCP uses organic catalysts and is advantageous in terms of low cost. Because OCCP can impart various functions in polymers, OCCP is a highly versatile industrial method amenable to a variety of products. We are expanding products in color materials and also extending product area to information technology, environment, and energy. Their commercialization will greatly contribute to industry. Dainichiseika Color and Chemicals Mfg. expects several billions JPY as annual sales of OCCP-related products.

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WO2008/139980, WO2009/136510, WO2010/027093, WO2010/140372, WO2011/016166, etc.

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<Contact>

JST/ IP Management & Licensing Group Phone: +81-3-5214-8486, E-mail: license@jst.go.jp