Supporting information

One-step synthesis of polypyrrole-coated silver nanocomposite particles and their application as a coloured particulate emulsifier

Syuji Fujii*\(^a\), Atsushi Aichi\(^a\), Kensuke Akamatsu\(^b\) and Hidemi Nawafune\(^b\), Yoshinobu Nakamura\(^a\)

\(^a\) Department of Applied Chemistry, Osaka Institute of Technology, 5-16-1 Ohmiya, Asahi-ku, Osaka, 535-8585, Japan. Fax: +81 (0)6-6954-4274; Tel: +81 (0)6-6954-4274; E-mail: s.fujii@chem.oit.ac.jp
\(^b\) Graduate School of Science and Faculty of Science and Engineering, Konan University, 8-9-1, Okamoto, Higashinada, Kobe 658-8501, Japan.

* Author to whom correspondence should be addressed (s.fujii@chem.oit.ac.jp).

Electron diffraction pattern was captured using transmission electron microscope (a JEOL JEM-2000EX).

Figure S1. Electron diffraction pattern obtained from PPy-coated Ag nanocomposite particles synthesized by chemical oxidative dispersion polymerization.
Fourier transform infrared (FT-IR) spectroscopy studies were carried out on samples dispersed in KBr discs using a SHIMADZU IRPrestinge-21 (20 scans per spectrum at 4 cm⁻¹ resolution).

Figure S2. FT-IR spectra of PPy-Ag nanocomposite particles, PPy homopolymer and AgNO₃. The PPy homopolymer was prepared by precipitation polymerization of pyrrole with FeCl₃ as an oxidant in aqueous medium.
Figure S3. FT-IR spectra of PPy-Ag nanocomposite particles before and after dedope using NaOH at pH 12 for 7 days.
Emulsion type.

Emulsion type was determined by conductivity measurement and drop test. The conductivities of aqueous nanocomposite dispersion and the emulsion immediately after preparation were measured to be 62 and 60 $\mu$S cm$^{-1}$, respectively, using a digital conductivity meter (Hanna model Primo 5). These high conductivities indicated an oil-in-water emulsion. These results were confirmed by the drop test.

Optical Microscopy.

A drop of the diluted emulsion was placed on a microscope slide and viewed using an optical microscope (Motic BA200, Shimadzu) fitted with a digital system (Moticam 2000, Shimadzu).

Acknowledgements

We are grateful to Dr. Furuzono Tsutomu, Dr. Masahiro Okada and Mr. Hidekatsu Sawa of NCVC for SEM studies. Professor Yoshiaki Hirano of Osaka Institute of Technology is acknowledged for his assistance.