

Visualization of PEO-PBLA-pyrene polymeric micelles by atomic force microscopy.

廖嘉鴻

Liaw J;Aoyagi T;Kataoka K;Sakuara Y and Okano T

Abstract

PURPOSE: To directly visualize and evaluate the aqueous block copolymeric micelles, poly(ethylene oxide)-poly(beta-benzyl L-aspartate) (PEO-PBLA) chemically conjugated with pyrene fluorescence molecule, by nanotechnology of atomic force microscopy (AFM). **METHODS:** The block copolymers' PEO-PBLA-Pyrene was first synthesized by reacting with pyrene sulfonyl chloride and PEO-PBLA in tetrahydrofuran (THF) solution and were identified by GPC reflect index, UV and fluorescence detectors. The characterization of physical and chemical properties of PEO-PBLA-Pyrene polymeric micellar solution were examined by the dynamic light scattering (DLS) and critical micelles concentrations (CMC). In addition, the nanotechnology of AFM was used to directly visualize the size and shape of nanopolymeric micelles. **RESULTS:** The pyrene fluorescence molecule were successfully conjugated at the amino group of the end of PBLA chain by GPC with three different detectors. The size of the aqueous PEO-PBLA-Pyrene polymeric micelles was detected around 57 nm with unimodal distribution by DLS measurement. As a result of this finding, the CMC test was also found out that the fluorescence intensity was increasing around 0.01 approximately 0.05 mg/ml. Using AFM evaluation of polymeric micellar solution, the morphology of aqueous PEO-PBLA-Pyrene polymeric micelles was observed on round shape and with the narrow dispersity of size range 50 approximately 80 nm. **CONCLUSIONS:** The presence of PEO-PBLA copolymers with pyrene in an aqueous system formed in a spherical and nano range of polymeric micelles.