

Optical property improvement of reactive BAPC/DAP blends with the aid of nano-silica coated titania

Yajiang Yang*, Xiaoping Zeng

School of Chemistry and Chemical Engineering, Huazhong University of Science and Technology, Wuhan 430074, China

Halloysites are a kind of aluminosilicate clay with a morphology of a nanotube.¹ The inner wall of halloysite is positively charged and the external surface is negatively charged.² In this work, we propose a simple and facile method to prepare Ag NPs loaded in the lumen of halloysite nanotubes (HNTs). Herein, N-acetyl-L-cysteine modified silver nanoparticles (Ag NPs) with negative charges spontaneously and stably resided in the lumen of HNTs via electrostatic interactions. The

images of transmission electron microscopy and scanning transmission electron microscopy showed that Ag NPs with a size of ~2.6 nm were uniformly distributed in the lumen of HNTs. The obtained Ag NPs/HNTs composites show excellent catalytic activity when they were used as catalyst. The catalytic activity of the Ag NPs/HNTs composites was evaluated by the reduction reaction of 4-nitrophenol (4-NP) as a model reaction. When the molar ratio of Ag and 4-NP was set at 0.008, the rate constant of the reaction was found to be 0.91 min⁻¹, 2 times higher than that of Ag NPs adsorbed on the external surface of HNTs. Additionally, no Ag NPs were found in the supernatant after the Ag NPs/HNTs suspension was stirred for 30 min. Such structural stability implies good reusability as a catalyst.

yjyang@hust.edu.cn