Investigation of spatial self-phase modulation of silver nanoparticles in clay suspension

ABSTRACT

We have investigated the spatial self-phase modulation (SSPM) phenomena in a clay suspension containing silver nanoparticles. Silver nanoparticles (Ag-NPs) were synthesized in the space of lamellar structure of montmorillonite (MMT) by using chemical reducing agent. The UVï vis spectra of the obtained Ag-NPs showed that the intensity surface plasmon resonance (SPR) peaks increase with increasing in concentration of AgNO3. The results from Ag-NPs UVï vis spectra were in good agreement with the structure studies performed by TEM. The SSPM phenomena manifestation of the non-linear optical property appeared only when MMT suspension filled with Ag-NPs as shown in the existence of far-field pattern. This property increased with the increase of Ag-NPs concentration and limited to small range.

Keyword: Spatial self-phase modulation; Non-linear optic; Silver nanoparticle; Montmorillonite