At the same time, the composition of LDH is controllable with less impurity which is safe for food packaging application.

Brief Description of Drawings

The accompanying drawings illustrate a disclosed embodiment and serves to explain the principles of the disclosed embodiment. It is to be understood, however, that the drawings are designed for purposes of illustration only, and not as a definition of the limits of the invention.

Fig. 1

[Fig. 1] shows a schematic structure of LDH with positively charged layers (**100**) and interlayer anions (**200**).

Fig. 2

[Fig. 2] shows TEM image of Mg_2Al LDH (Zeta potential +16.4 ± 1.1 mV) with length of about 400 nm.

Fig. 3

[Fig. 3] shows the XPS spectra of (a and a') LDH (Zeta potential +31.1 mV), (b and b') LDH/PAA and (c and c') LDH-5% SA and (d and d') LDH-12.5% SA using Mg Kα (top row) and Al Kα (bottom row) X-rays, where the appearance of new shoulder on the left demonstrated the strong bonding between LDH and PAA or SA.

Fig. 4

[Fig. 4] shows The FTIR spectra of LDH (Zeta potential +31.1 mV), PAA, LDH/PAA and LDH/SA where the observation of new aliphatic chain peak between 2750 and 3000 cm^{-1} and free CO_3^{2-} peak in LDH-12.5%SA demonstrates the formation of interfacial bonding between SA and LDH in LDH/SA.

Fig. 5

[Fig. 5] shows XRD results showing no significant changes in the characteristics peaks of LDH (Zeta potential +31.1 mV) before and after SA modification.

Fig. 6

[Fig. 6] shows coating suspensions by adding PAA first followed by PVA (sequence of addition: LDH/H_2O + silane + PAA + PVA) (A), and by adding PVA first followed by PAA (sequence of addition: LDH/H_2O + silane + PVA + PAA) (B).

Fig. 7

[Fig. 7] shows UV-Vis data of the PET/LDH-PVA-PAA/LLDPE film.

Fig. 8

[Fig. 8] shows transparency of the PET/LDH-PVA-PAA/LLDPE film: (A) no film on the logo; (B) with LDH/(PVA-PAA) coated PET film on the logo.