

# Electronic Supplementary Information for Study on UV-shielding Mechanism of Layered Double Hydroxides Materials

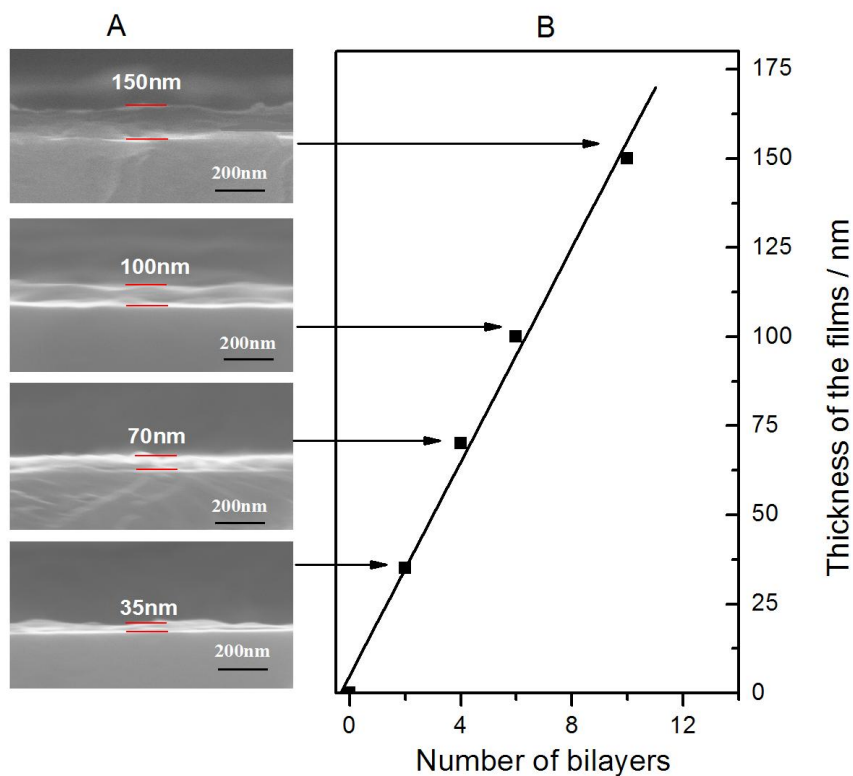
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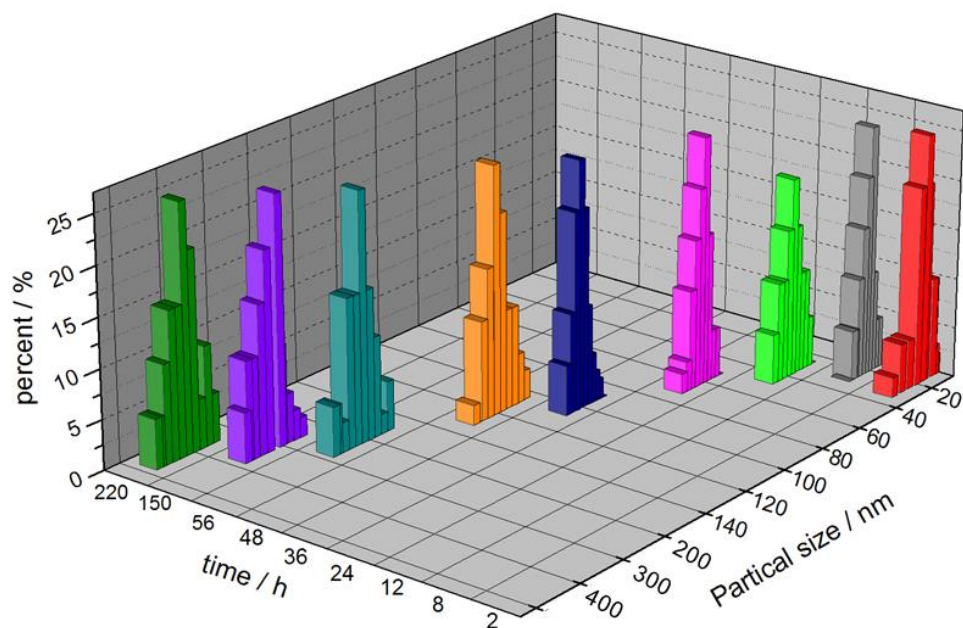
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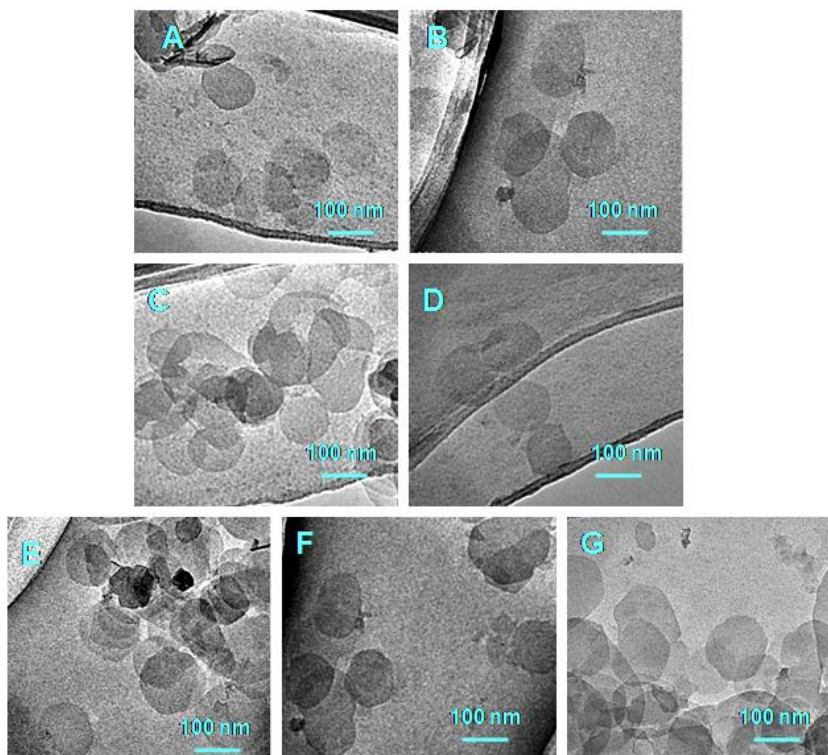
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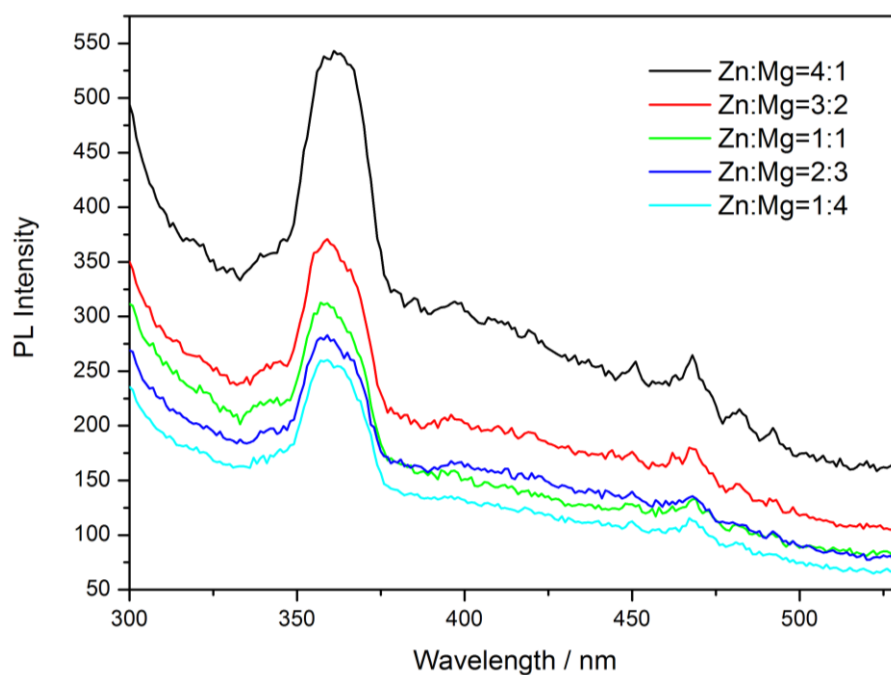
**Figure S1.** (A) Side view of SEM images for the  $(\text{Mg}_2\text{Al-CO}_3\text{-LDHs/PAA})_n$  films with  $n=2, 4, 6$  and  $10$ , respectively; (B) thickness of these films as a function of  $n$ .



**Figure S2.** Particle size distributions of Mg<sub>2</sub>Al-CO<sub>3</sub>-LDHs nanoparticles ( $t=2, 8, 12, 24, 36, 48, 56, 150$  and  $220$  h, respectively).



**Figure S3.** TEM images of the (Zn<sub>x</sub>Mg<sub>y</sub>)<sub>2</sub>Al-CO<sub>3</sub>-LDHs nanoparticles ( $x:y = 0:1, 1:4, 2:3, 1:1, 3:2, 4:1$  and  $1:0; x+y = 1.0$ ).



**Figure S4.** Photoluminescence spectra of  $((\text{Zn}_x\text{Mg}_y)_2\text{Al-CO}_3\text{-LDHs/PAA})_{10}$  films with various  $\text{Zn}^{2+}/\text{Mg}^{2+}$  ratios.

**Table S1** The light intensity decay data of the  $(\text{ZnMgAl-CO}_3\text{-LDHs/PAA})_n$  ( $n=1-10$ ) films

| Wavelength /nm | $\beta$ | $(1-R)^2$ | $r^2$ |
|----------------|---------|-----------|-------|
| 250/UVC        | 0.647   | -88.345   | 0.998 |
| 300/UVB        | 0.447   | -87.946   | 0.997 |
| 350/UVA        | 0.325   | -87.472   | 0.996 |

$\beta$  is absorption coefficient;  $R$  is reflection coefficient. The goodness of fit is indicated by the value of  $r^2$ .