

Article

Polydopamine-Modified Al₂O₃/Polyurethane Composites with Largely Improved Thermal and Mechanical Properties

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We can find that unmodified alumina is exposed to the fracture surface, which indicates poor interface adhesion between Al₂O₃ and pure PU. And there are some serious agglomerations. Polydopamine-modified composites have better dispersion. When the particle content is small, alumina is surrounded by PU in the composites, and the particles cannot contact each other well, failing to form a good thermal conduction path. Therefore, when the particle content is low, the thermal conductivity is also poor, which is consistent with the results of the above thermal conductivity.

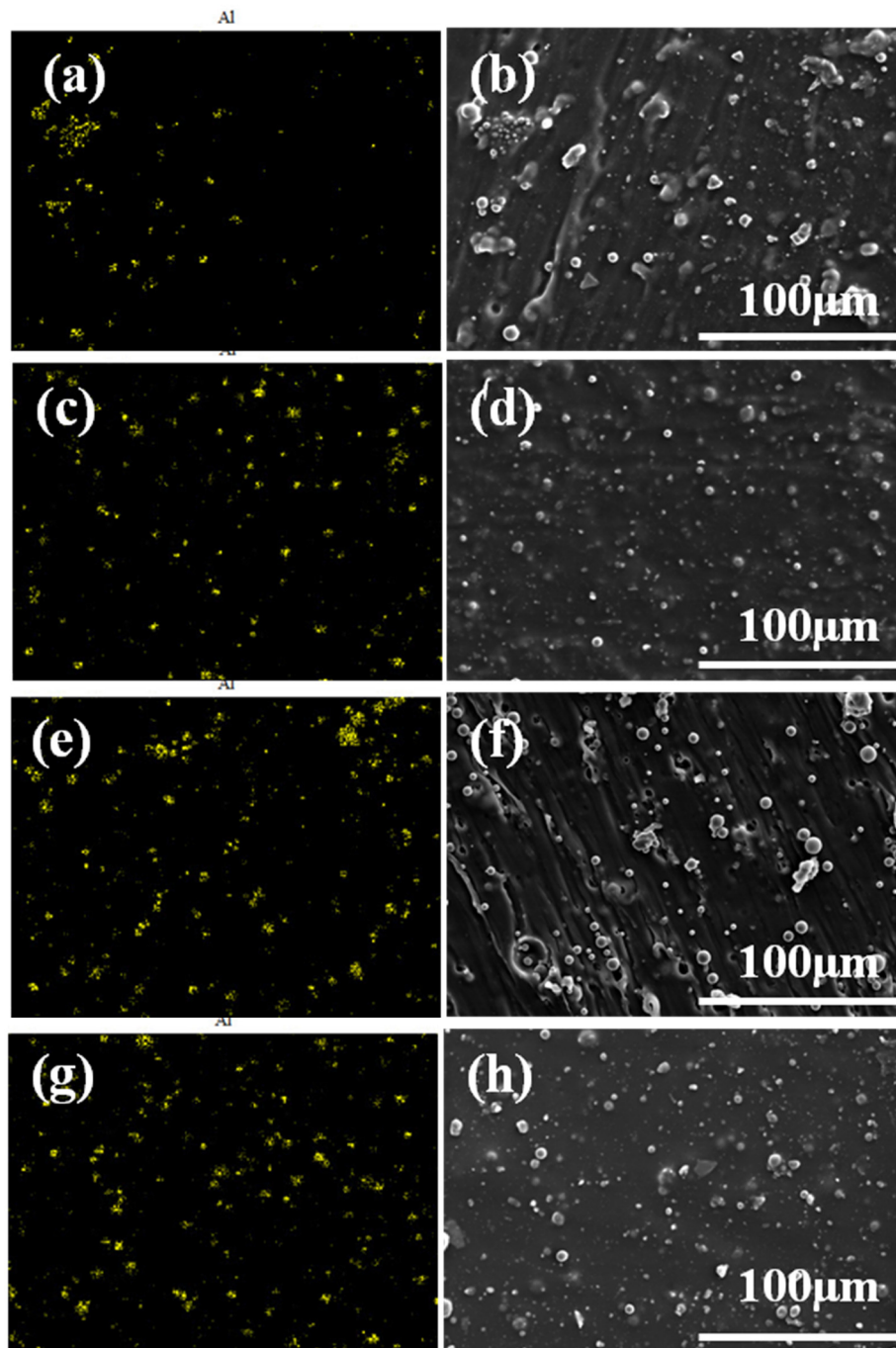


Figure S1. SEM morphology of $\text{Al}_2\text{O}_3/\text{PU}$ and $\text{PDA-Al}_2\text{O}_3/\text{PU}$ composites filled with (a) 10 wt% Al_2O_3 , (c) 10 wt% $\text{PDA-Al}_2\text{O}_3$, (e) 20 wt% Al_2O_3 , (g) 20 wt% $\text{PDA-Al}_2\text{O}_3$, EDS element distribution of yellow spots in (b) 10 wt% $\text{Al}_2\text{O}_3/\text{PU}$ (d) 10 wt% $\text{PDA-Al}_2\text{O}_3/\text{PU}$ (f) 20 wt% $\text{Al}_2\text{O}_3/\text{PU}$ and (h) 20 wt% $\text{PDA-Al}_2\text{O}_3/\text{PU}$.

