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Communication

Polyhedral Oligomeric Silsesquioxane (POSS) Surface Grafting: A Novel Method to Enhance Polylactide Hydrolysis Resistance

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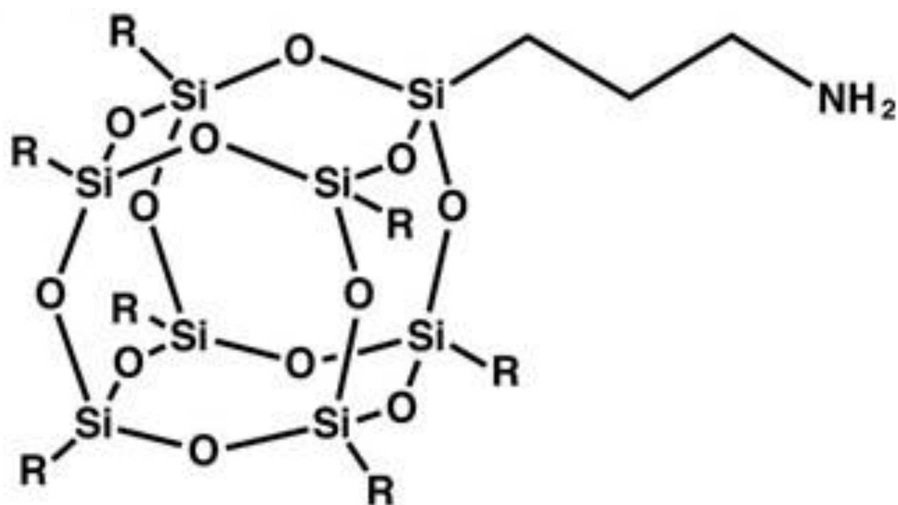


Figure S1. Aminopropyl heptaisobutyl POSS (POSS-NH_2).

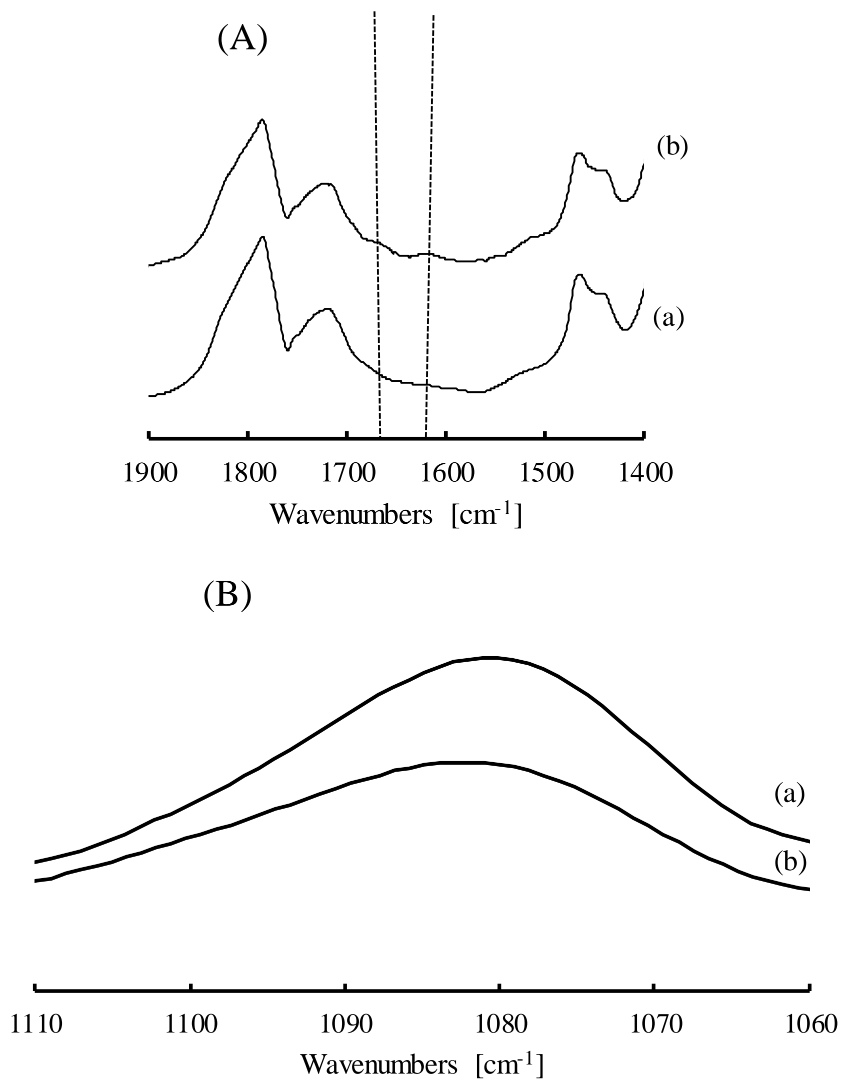


Figure S2. (**A**) FTIR spectra of: (a) PLLA neat film and (b) PLLA_POSS_8_60 film in the range 1900–1400 cm^{-1}, (**B**) FTIR spectra of: (a) PLLA neat film and (b) PLLA_POSS_8_60 film in the range 1110–1060 cm^{-1}.

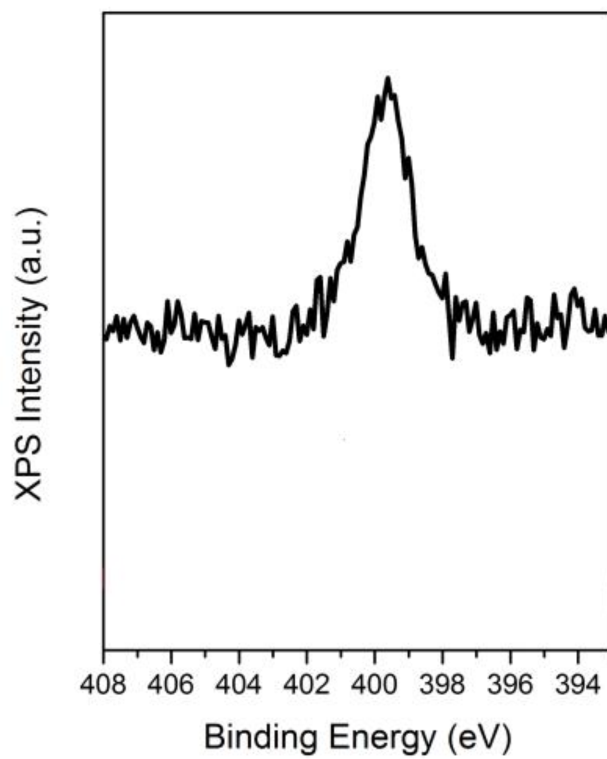


Figure S3. XPS spectrum collected on POSS-NH_2 powders. The data are shown in the energy region typical for N 1s photoelectrons after subtraction of Shirley-type background. Data are shown after normalization.

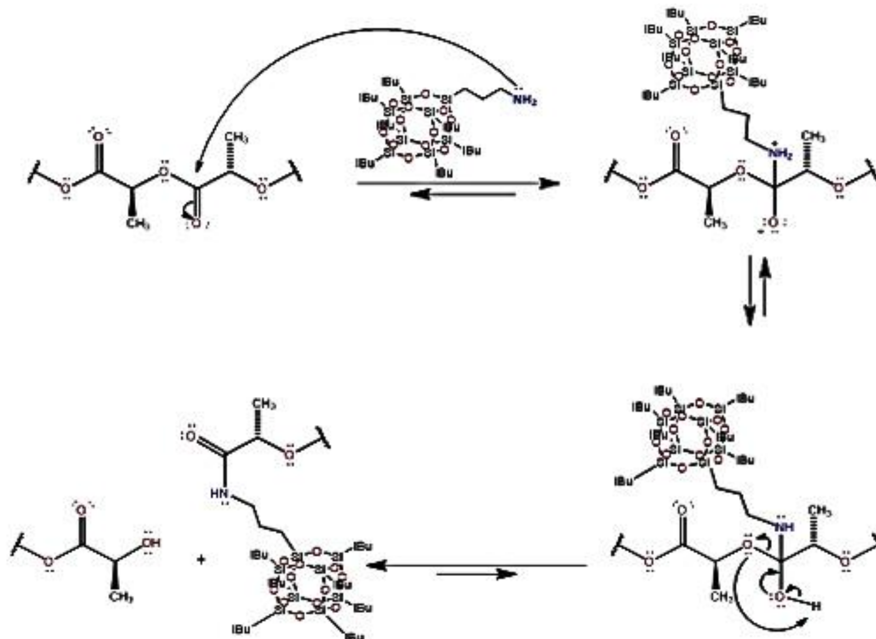


Figure S4. Reaction mechanism of the reaction between POSS-NH_2 and PLLA.

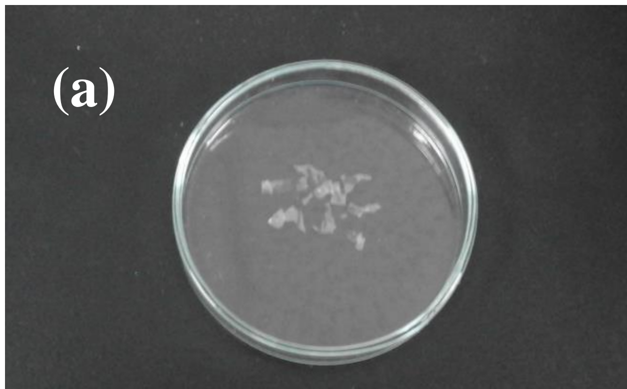
Table S1a. DSC results of neat PLLA and of treated films (second heating).

Sample code	T_g (℃)	T_{cc} (℃)	T_m (℃)	ΔH_{cc} (J/g)	ΔH_m (J/g)
PLLA	60	130	153	5	6
PLLA_POSS_4_40	61	133	154	5	6
PLA/POSS_8_40	60	131	154	4	6
PLLA_POSS_4_60	60	130	153	5	6
PLLA_POSS_8_60	348	130	153	5	6

T_g: glass transition temperature, T_{cc}: cold crystallization temperature, T_m: melting temperature, ΔH_{cc}: enthalpy of the cold crystallization, ΔH_m: melting enthalpy.

Table S1b Characterization results of neat PLLA and of treated films.

Sample code	T_{onset} (℃)	T_{max} (℃)	Contact angles (°)
PLLA	329	367	71 ±2
PLLA_POSS_4_40	331	369	87 ±1
PLA/POSS_8_40	334	371	91 ±2
PLLA_POSS_4_60	341	374	91 ±2
PLLA_POSS_8_60	348	378	101 ±1



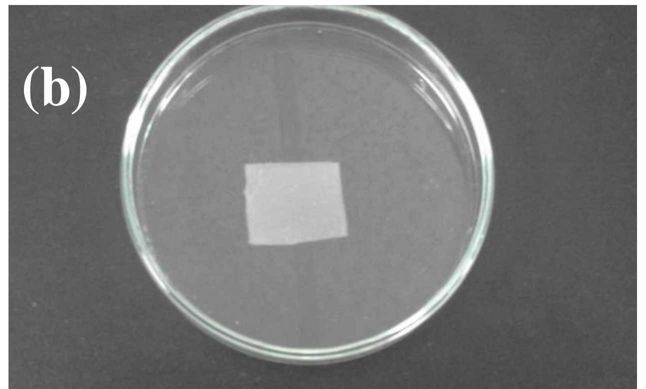


Figure S5. Photos of (**a**) PLLA film and (**b**) PLLA_POSS_8_60 film after being in contact with the buffer for 4 weeks at 50 °C.