

Abstract Submitted
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Thermally Induced Lateral Motion of α -Zirconium Phosphate Layers Intercalated with Hexadecylamines KOOKHEON CHAR, BONG-WOO HA, School of Chemical Engineering, Seoul National University — Well-defined intercalated structure, either interdigitated layers or bilayers, of hexadecylamines (HDAs) in a confined space of a highly-functionalized layered material, α - zirconium phosphate (α -ZrP), was prepared and these two distinct intercalated structures can serve as model systems to investigate the interaction of the two monolayers whose amphiphilic tails are adjacent to each other. Acidic functional groups (-POH) on the α -ZrP are in well-ordered array and the number of functional group is quite high (i.e., cationic exchange capacity (CEC) = 664 mmole/100 g, area per one charge site = 0.24 nm²) enough to realize the bilayers (i.e., discrete two monolayers) of HDAs within the α -ZrP interlayer. We employed the two-step intercalation mechanism for the preparation of well- ordered interdigitated layers as well as the bilayers of alkyl chains attached to both sides of the α -ZrP intergallery. An intriguing lateral motion of the α -ZrP sheets was observed with in-situ SAXS measurements for the interdigitated layer during heating and cooling cycle and verified with TEM. This lateral motion is believed to be due to the transition from the tilted to the untilted conformation of the interdigitated HDA chains and this transition is found to be thermally reversible.

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