



Quo Vadis Chemie

Synthetic Clay Minerals: Materials Chemistry in Two Dimensions: Pillaring, Delamination, Restacking



which will be delivered by

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on 22.10. at 15:00

the Lecture Hall CH2, the School of Chemistry Building, FoS CU, Hlavova 8, Praha 2

The intrinsically anisotropic bonding in layered silicates enables spontaneous delamination by osmotic swelling, where continuum electrostatic repulsion separates stacks into individual layers with high precision producing highly ordered lamellar liquid crystalline phases. This requires, however, a homogenous charge density only found with clays synthesized from the melt at temperatures above 1000 K. Utterly controlling homogeneity and thus in-tracrystalline reactivity, moreover, allows for synthesis of regular heterostructures that may be delaminated into double stacks with any kind of functional molecules sandwiched between two clay layers. This way emitters may e.g. be oriented in a quasi-epitaxial way allowing for polarized emission or the heterostacks may be turned into Janus platelets. Mixing liquid crystalline clay suspensions containing platelets of aspect ratios ~ 20000 with polymer solutions allows to manufacture nanocomposite for applications stretching from flexible food packaging to optoelectronic devices.

