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Janus and Gemini Nanoplates ZHENGDONG CHENG, ANDRES MEJIA, YA-WEN CHANG, PENG HE, Artie McFerrin Department of Chemical Engineering, Texas A&M University, College Station, TX 77840, AGUSTIN DIAZ, ABRAHAM CLEARFIELD, Department of Chemistry, Texas A&M University, College Station, TX 77842 — Janus particles were used to make stable Pickering emulsions (emulsions stabilized by particles). Here we demonstrated a novel method to produce high aspect ratio Janus plates with atomic thickness. Gemini plates with only the edges functionalized are also fabricated. These novel nanoplates are observed to have super surface activity. Most importantly, these particles overcome the two *opposite* effects in the stabilization of Pickering emulsions using spherical particles: stabilization requires particles as small as possible; but smaller particles are easy to escape the interface due to Brownian motion since the adsorption energy to the oil-water interface is proportional to the diameter of the spheres. Our nanoplates have a *large* aspect ratio due to the extremely thin thickness, which offers extraordinary stability to the liquid film between two emulsions to prevent coalescence. In the meantime, their large lateral surface area offers strong adsorption energy at the oil-water interface.

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