Supporting Information

Assembly of Oriented Zeolite Monolayers and Thin Films on Polymeric Surfaces via Hydrogen Bonding

Ming Zhou, Xiufeng Liu, Baoquan Zhang,* and Huiming Zhu*

School of Chemical Engineering and Technology, Tianjin University, Tianjin 300072 (China)

xfliu@tju.edu.cn, bqzhang@tju.edu.cn

Binding Strength between Silicalite-1 Crystals and the Substrate Surface. The survival ability for silicalite-1 crystals to be detached from bare glass plate, glass plate supported PEO, PMMA, PVA and chitosan films was measured by sonicating the monolayers in the ultrasonic bath for 1, 5, 10, 20 and 30 min, respectively. As shown in Figure S1, the binding strength between silicalite-1 crystals and various polymeric films is much stronger than that between silicalite-1 crystals and the bare glass plate. After sonication for 5 min, most silicalite-1 crystals were still on the PEO, PMMA, PVA and chitosan films. On the contrary, most silicalite-1 crystals were detached from the bare glass plate after sonication for 5 min. When the sonication lasted for 20 min, almost all

the silicalite-1 crystals were detached from the bare glass plate, whereas substantial amount of silicalite-1 crystals were still kept on glass plate supported PEO, PMMA, PVA and chitosan films.

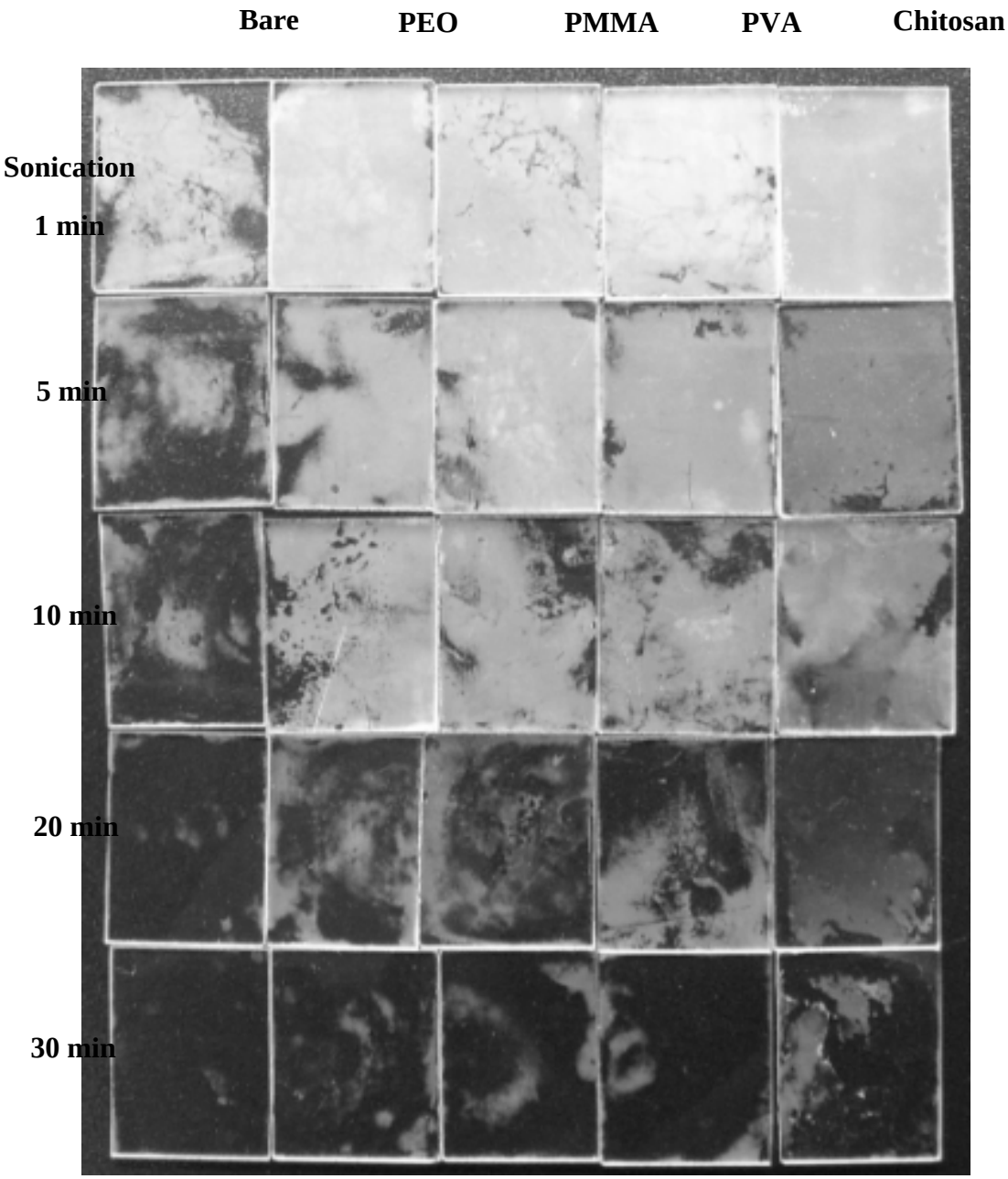

Figure S1. The survival ability for silicalite-1 crystals to be detached from bare glass plate, glass plate supported PEO, PMMA, PVA and chitosan thin films after sonication for 1, 5, 10, 20 and 30 min.

Effect of Rubbing Pressure on the Binding Strength. To check the influence of rubbing pressure on the binding strength between silicalite-1 crystals and the polymeric surface, two zeolite monolayers on glass plate supported chitosan films were prepared by respectively using gentle rubbing (approximately 4×10^3 Pa) and hard rubbing (approximately 4×10^4 Pa) during the manual assembly. The binding strength of each monolayer was evaluated by sonicating the monolayer in the ultrasonic bath for 1, 10, 20 and 30 min. According to our experimental observations shown in Figure S2, the rubbing pressure does not affect the binding strength between silicalite-1 crystals and the substrate surface. It should be noted that the zeolite monolayer is usually fabricated by using hard rubbing if it is not specially indicated.

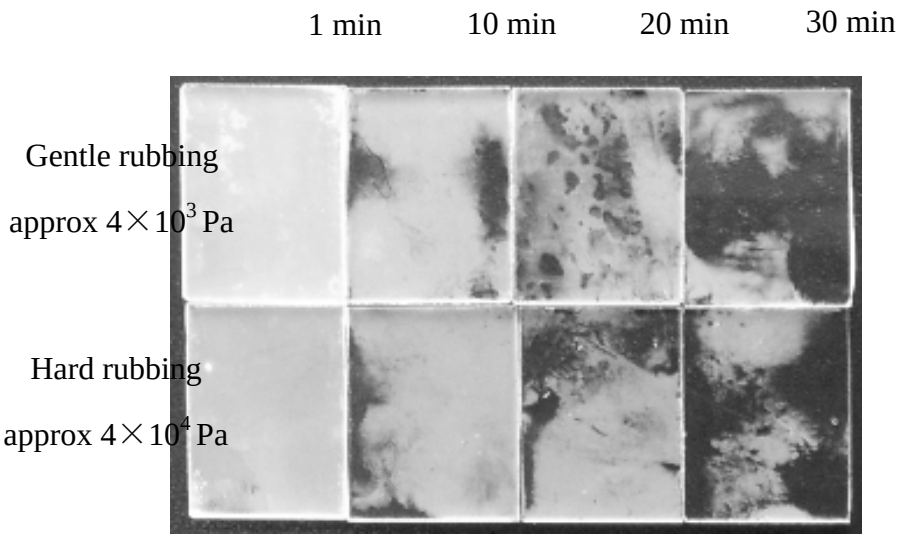

Figure S2. The survival ability for silicalite-1 crystals to be detached from glass plate supported chitosan thin films after sonication for 1, 10, 20 and 30 min. The silicalite-1 monolayers were fabricated by way of gentle rubbing (top) and hard rubbing (bottom), respectively.