



Title: Studying the Genesis of Nanobubbles on Zeolite and Metal Organic Framework Thin-Films by Scanning Probe Microscopy

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Surface nanobubbles are tiny gas bubbles with relatively long lifetimes that can be found on surfaces of immersed substrates. They may be induced by (electro-)catalysis, this is generally undesirable since they can block contact between the catalyst surface and the liquid phase. Therefore, it is of interest to gain insight into the influence of the substrate on their formation. In this project, I will try to correlate surface heterogeneities with nanobubble formation. In order to do this the genesis of nanobubbles at the surface of thin-film zeolites and MOFs will be studied. This will be done using scanning probe microscopy techniques, such as liquid-phase AFM and Kelvin probe microscopy. Formation of nanobubbles will be induced on thin-film zeolites through solvent exchange and temperature variations. MOFs will be employed in electrocatalysis to induce formation of gas bubbles.