

Carbon dioxide methanation in operando: from thermal catalysis to electrocatalysis

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In this talk, I will present a multi-length scale analysis of hydrotalcite derived Ni-Fe systems with the aim to provide a molecular level understanding of the activation/deactivation mechanism and clarify the promotion and stabilizing effect of Fe during the methanation reaction. Techniques of interest include surface sensitive ambient pressure X-ray photoelectron spectroscopy (APXPS) and near-edge X-ray absorption fine structure (NEXAFS) spectroscopy, nanoprobe X-ray absorption spectroscopy and electron microscopy.

The dynamics during the thermal process will be compared and contrasted with those observed during the electrocatalytic methanation over Cu and Cu-bimetallic systems.