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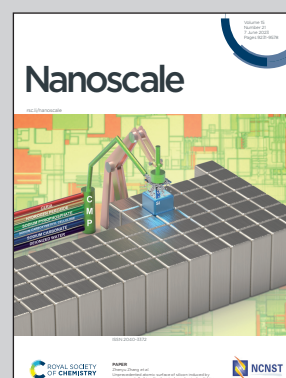


Showcasing research from Professors Meenesh Singh, Anh Ngo, and Santanu Chaudhuri's laboratory, Department of Chemical Engineering, University of Illinois Chicago, Illinois, USA.

Microkinetic insights into the role of catalyst and water activity on the nucleation, growth, and dissolution during COF-5 synthesis

The synthesis pathways for covalent organic frameworks (COFs) involve a complex sequence of reactions over a rippling energy landscape that cannot be described using existing theories. Here, we employ time-resolved *in-situ* FT-IR coupled with a large-scale microkinetic model to reveal previously unrecognized roles of catalyst pKa and water on COF synthesis. COF yield increases with decreasing catalyst pKa, whereas water reduces the growth rate and broadens the size distribution.

As featured in:



See Meenesh R. Singh *et al.*,
Nanoscale, 2023, **15**, 9329.