

# An isorecticular family of expanded photo-redox active titanium metal-organic frameworks

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Extensive research has been performed on isorecticular metal-organic frameworks, MOFs, prepared with most of the transition metals; however, isorecticular MOFs based on titanium are less abundant. Ti-MOFs have attracted significant attention because they tend to exhibit unique photoredox activity. An example of isorecticular Ti-MOFs are the MIL-125-NHR series where their photocatalytic activity and kinetics is limited by their small pore aperture. Here, we present the synthesis, and powder-based crystallography of a new family of isorecticular titanium metal-organic frameworks (UCFMOFs) based on a **hex** net from a 1-dimensional rod-shaped titanium oxide cluster and bipheyl, terphenyl, and quaterphenyl dicarboxylate organic links. By utilizing Pair Distribution Function from total scattering data as well as high-resolution powder diffraction, and solid-state NMR spectroscopy, we elucidated the crystal structure of these MOFs. Furthermore, we demonstrate their enhanced photoredox activity towards the catalytic oxidation of benzyl alcohol.

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