CHEMISTRY

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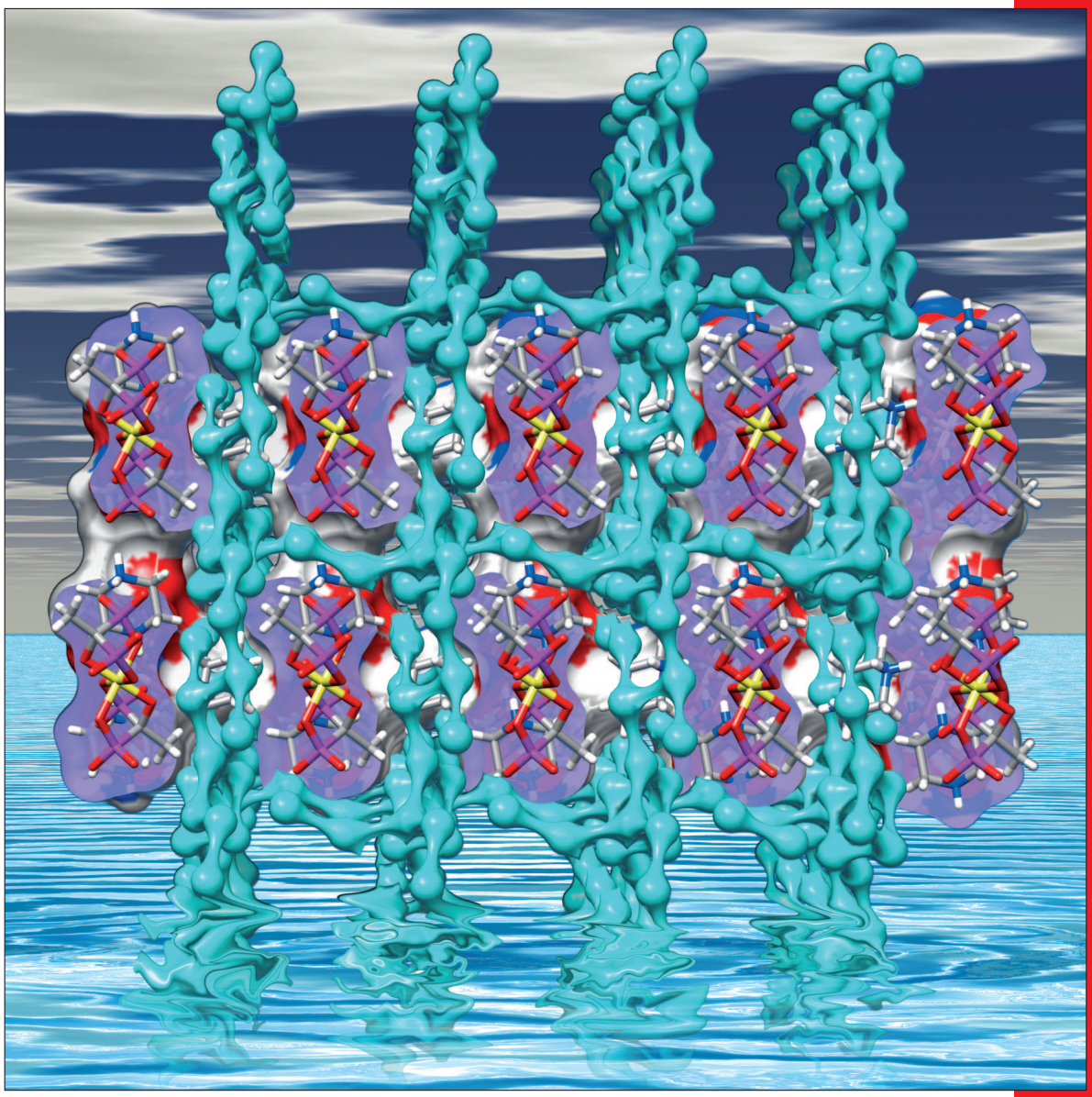

Concept

An Alternative Mechanistic Concept for Homogeneous Selective Ethylene Oligomerization of Chromium-Based Catalysts: Binuclear Metallacycles as a Reason for 1-Octene Selectivity?

W. Müller, U. Rosenthal et al.

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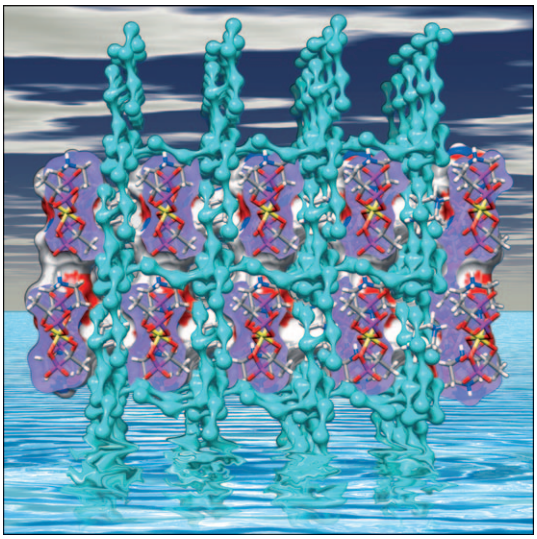
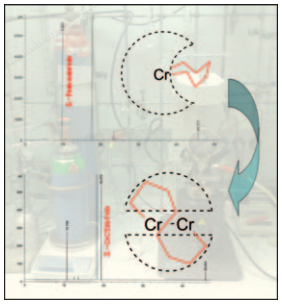
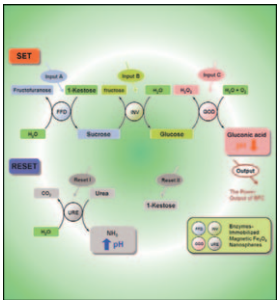
… 3D interpenetrated networks of hydrogen-bonded water molecules and a hybrid matrix have been found in a novel supramolecular salt, $[H_2pip]_3[Ge(hedp)_2]\cdot 14\,H_2O$ ($H_2pip^{2+} = C_4H_{12}N_2^{2+}$; $hedp^{5-} = C_2H_3P_2O_7^{5-}$). In their Full Paper on page 7741 ff., J. Rocha et al. demonstrate that this "ice framework" is stable at ambient temperature for long periods of time. The heating of this salt leads to a sequential framework deconstruction process, which occurs in a stepwise fashion from a 3D network into layers (2D) and, ultimately, discrete water aggregates (0D).

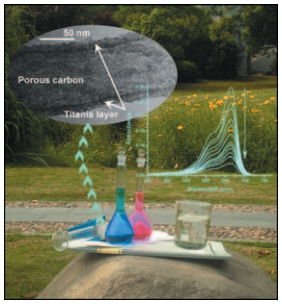




Selective Switching
Switching from selective trimerization of ethylene to selective tetramerization is assigned to the ability of ligands to bridge two chromium centers. This binuclear complex is able to couple two C4 units to a C8 chain between the two metals, thus determining 1-octene selectivity. Further details are described in the Concept article by W. Müller, U. Rosenthal et al. on page 7670.

Molecular Devices
In their Communication on page 7719 ff., S. Dong, J. Wang et al. demonstrate a novel biocomputing security system based on a self-powered and reusable biofuel cell (BFC), mimicking a keypad lock device. Coupling BFCs with keypad locks might not only significantly increase the versatility of BFCs resulting in the BFC-based biocomputing security system, but also greatly enhance the adaptability of the keypad lock to future self-powered and reusable biocomputing security system based bioelectronic devices.





Advanced Nanomaterials
A natural cellulosic substance was employed to make a nanostructed titania–carbon hybrid fiber material that shows enhanced photocatalytic degradation efficiency of organic pollutants in water. For more details see the Full Paper by J. Huang et al. on page 7730 ff.