

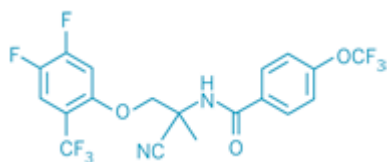
method, a team of researchers at Pacific Northwest National Laboratory and China's Dalian Institute of Chemical Physics has identified the active species in a molybdenum-based zeolite (aluminosilicate) catalyst that converts methane to benzene: It's an Al-O-Mo linkage (*J. Am. Chem. Soc.* **2008**, *130*, 3722). The study could lead to efficient methods for transforming methane into more valuable and easily transported liquid fuels and chemicals, which in turn could provide the chemical industry with incentives to tap supplies of natural gas in remote areas. To boost ordinarily weak molybdenum NMR signals, Heng Zheng, Xinhe Bao, and coworkers prepared a series of catalysts from a ^{95}Mo -enriched precursor material, evaluated the materials' catalytic activities, and used an ultra-high-field NMR method to probe the samples. On the basis of those measurements, the team concluded that during catalyst preparation molybdenum atoms migrate into the zeolite's channels and anchor onto acidic aluminum sites, thereby forming Al-O-Mo linkages. These structures serve as catalytically active centers in the methane conversion reactions.

Revised Amination Skips Olefin Tether



Last year, M. Christina White's group at the University of Illinois, Urbana-Champaign, developed the first catalytic amination method for transforming an allylic C–H bond to a C–N bond, bypassing an oxygenation step formerly needed for such conversions (*C&EN*, June 4, 2007, page 7). The researchers overcame the low reactivity of the reaction's carbamate nucleophile by tethering it to the olefin being converted, restricting the method to intramolecular reactions. Now, in work that could speed small-molecule synthesis, White and graduate student Sean A. Reed have gone a step further and avoided the tether by developing an intermolecular version of the reaction (*J. Am. Chem. Soc.* **2008**, *130*, 3316). The amination (shown) directly converts a broad range of α -olefins to linear allylic amines with good yields and high regio- and stereoselectivities. The reaction uses two catalysts: a palladium sulfoxide complex for C–H cleavage and a chromium salen complex for amine functionalization. To demonstrate the reaction's advantages, White and Reed synthesized a conformationally restricted analog of the antibiotic deoxynegamycin. In that synthesis a nitrogen group was installed in just two steps from a commercial precursor. In contrast, the previous best method required oxygenation and took seven steps.

New Worm Weapons For Grazing Livestock



When sheep and cattle graze, they sometimes devour far more than a square meal. Increasingly, the grazers are becoming infected with drug-resistant parasitic worms that cause life-threatening anemia. A research team led by Ronald Kaminsky at the Novartis Animal Health Research Center, St. Aubin, Switzerland, has reported the first new class of worm-killing-but ruminant-friendly—compounds in 25 years in *Nature* (**2008**, *452*, 176). The "worm weapons" are a family of amino-acetonitrile derivatives (the most potent one shown) that "will be the cause of great excitement, especially because they are active against a broad range of nematode pathogens," comment parasitologists Roger K. Prichard and Timothy G. Geary of McGill University, in Montreal, in an associated *Nature* commentary. The compounds paralyze the worms by targeting previously uncharacterized receptor subunits involved in the worms' neurotransmission. Knowing this mechanism of action at the outset may help monitor, if not delay, eventual drug resistance should the compounds reach the veterinary market, Prichard and Geary note.