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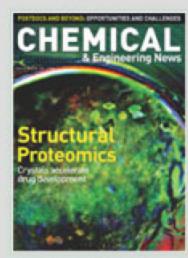
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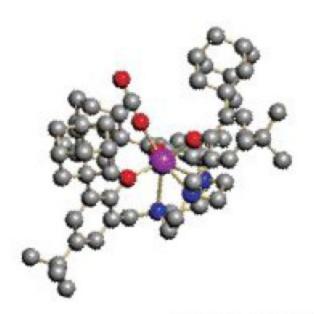
Science Concentrates

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Elusive CO₂ binding mode snagged

University of California, San Diego, chemists have isolated and structurally characterized a synthetic uranium complex that binds CO₂ in an unusual way: CO₂ is linearly coordinated to the metal via one of its oxygen atoms [Science, 305, 1757 (2004)]. This linear metal-CO₂ coordination mode had previously been observed in the crystal structure of an iron enzyme involved in antibiotic synthesis, but until now scientists had not been able to obtain definitive structural evidence for its existence in synthetic systems,



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according to Karsten Meyer and Ingrid Castro-Rodriguez. In their new synthetic complex, bulky adamantane groups that surround the metal force U-OCO coordination (shown; purple = uranium, red = oxygen, gray = carbon, and blue = nitrogen). From bond lengths, magnetization data, and electronic and vibrational spectra, Meyer and Castro-Rodriguez conclude that upon CO_2 binding, U(III) is oxidized to U(IV), and CO_2 is reduced by one electron. The study of this and other metal complexes that bind and reduce CO_2 may someday lead to the development of simple compounds that can convert excess CO_2 into useful chemicals, they say.