New delivery system for Viagra ingredient

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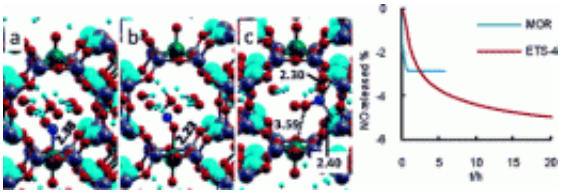

Scientists are reporting development and successful initial tests of a potential new delivery system for the biological signaling agent responsible for the effects of Viagra. It could be used to deliver the substance, called nitric oxide or NO, to treatment conditions ranging from heart disease to skin ulcers and other wounds that fail to heal, according to a report in the *Journal of the American Chemical Society.*

Joao Rocha and colleagues explain that NO acts as an important agent in the body for expanding blood vessels (its role in Viagra and related medicines for erectile dysfunction), preventing the formation of blood clots, aiding nerve signals, and repairing wounds. NO's multipurpose role makes it an exciting prospect for new drug development, but current NO delivery systems sometimes cause undesirable side effects. "Clearly, new materials and technologies are needed to store and target-deliver NO in biological amounts," the report notes.

The researchers developed a highly absorbent material that can carry varying amounts of NO. The material slowly releases NO at a rate that is

useful for treating diseases, they conclude. More work must be done to calculate the "shelf life" of the material loaded with NO, Rocha and colleagues note, but they conclude: "This work is a first step toward assessing the real potential therapeutic applications of these materials."

More information: "Slow Release of NO by Microporous Titanosilicate ETS-4", *J. Am. Chem. Soc.,* 2011, 133 (16), pp 6396–6402
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Abstract
A novel approach to designing nitric oxide (NO) storage and releasing microporous agents based on very stable, zeolite-type silicates possessing framework unsaturated transition-metal centers has been proposed. This idea has been illustrated with ETS-4 [Na9Si12Ti5O38(OH)·xH2O], a titanosilicate that displays excellent NO adsorption capacity and a slow releasing kinetics. The performance of these materials has been compared to the performance of titanosilicate ETS-10, [(Na,K)2Si5TiO13·xH2O], of benchmark zeolites mordenite and CaA, and of natural and pillared clays. DFT periodic calculations have shown that the presence of water in the pores of ETS-4 promotes the NO adsorption at the unsaturated (pentacoordinated) Ti4+ framework ions.

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