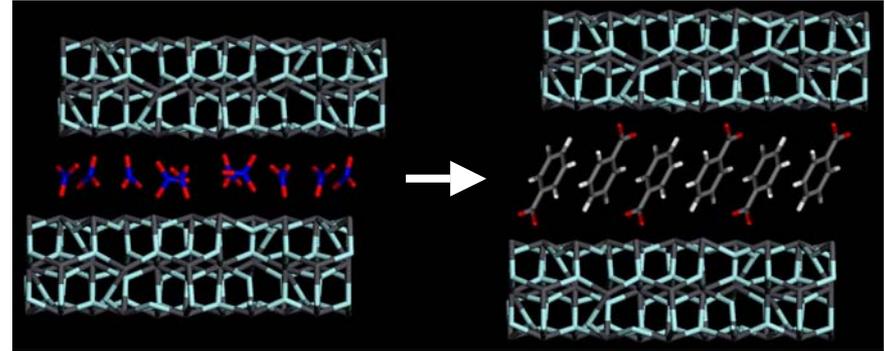


Anion-Exchange of Cationic Inorganic Materials

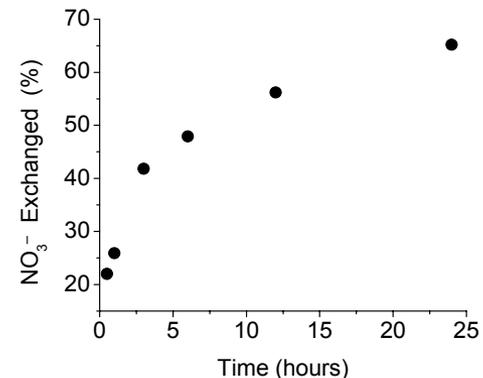
Scott R. J. Oliver, SUNY-Binghamton, DMR-0239607

Microporous materials are used extensively in industry, but all are negative in charge. We are synthesizing new materials that are “opposite”, that is positive in charge.

Anions reside in the pores, and are then swapped for pollutants (which exist naturally in anionic form). We have exchanged for a variety of other anions, as shown here. These anions include chromate and perrhenate, and we are extending to other pollutants: arsenate, technetate and selenite.



The anions may be swapped for others, inorganic or organic. This example shows benzoate anions fully replacing nitrates in the cationic material.



Absorption of perrhenate, a model anion for pertechnetate, a radioactive pollutant. This ¹⁴N NMR data confirms nitrate is released.

Anion-Exchange of Cationic Inorganic Materials

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Education

Many people have contributed to this work. Six graduates (Tolulope Salami, Dat Tran, Daniel Brennan, Tedmann Onyango, Shijun Wang and John Gontasz), many undergraduates (Yi-Sheng Kam, Kiril Marouchkin, Yaron Markfeld, Kevin Reilly, Hanyoung Han, Kanta Yamamoto, ...) and several postdocs. For a complete list, see: <http://chemistry.binghamton.edu/OLIVER/group.htm>

Brennan received an NSF K-12 Graduate Fellowship for 2002-03 to teach Chemistry to local Grade 5 students.

Tran received a Binghamton University Dissertation Year Fellowship for 2002-03.

Curriculum Development

In Spring 2004, the PI will again be teaching a senior level laboratory course in inorganic and materials chemistry.

Several modules will be developed based on the educational portion of his NSF Career Grant.

Lab experiments will be placed on the course website:

<http://chemistry.binghamton.edu/chem445>

**Oliver
Materials
Group**

May 2003

