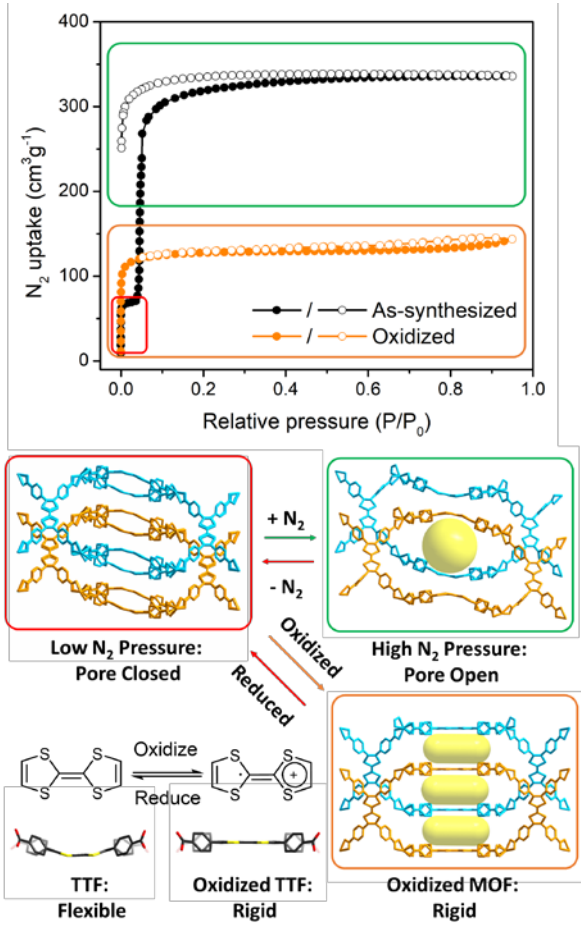
Redox-Switchable Breathing Behavior in Metal–Organic Frameworks



Switch between flexible and rigid. (Top): N_2 sorption isotherms of as-synthesized and oxidized MOFs. (Bottom): Crystal structures of MOFs under different environments. TTF moiety acts as the redox switch.

Scientific Achievement

The flexibility and breathing behavior of metal–organic frameworks (MOFs) was controlled by redox chemistry of tetrathiafulvalene (TTF) moieties in the framework.

Significance and Impact

The redox regulation of the MOF porosity and flexibility promises the development of smart adsorbents for gas separation and storage.

Research Details

- Two flexible isomeric MOFs were constructed from redox active TTF-based linkers
- Their breathing behaviors upon N_2 adsorption were studied by single crystal X-ray diffraction
- The rigidity of TTF-based linkers can be switched by redox reaction, which in turn controls the flexibility of MOFs

Su, J.; Yuan, S.; Wang, H.-Y.; Huang, L.; Ge, J.-Y.; Joseph, E.; Qin, J.; Cagin, T.; Zuo, J.-L.; Zhou, H.-C., *Nat. Commun.* **2017**, *8*, 2008. Work was performed at Texas A&M University