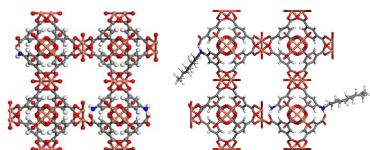
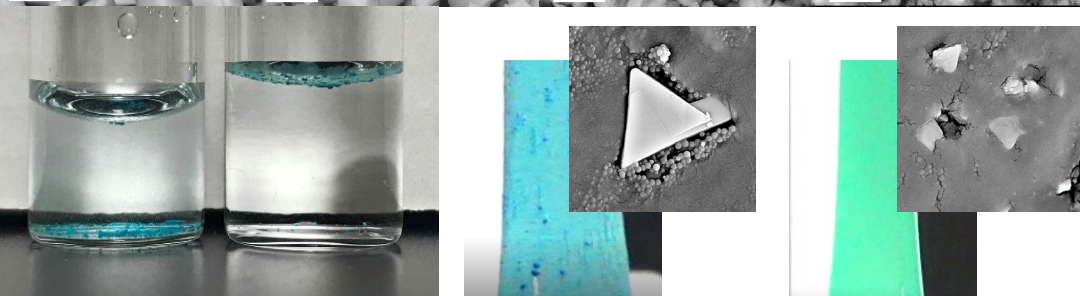


TECHNOLOGY OPPORTUNITY

IMPROVED MULTIVARIATE METAL ORGANIC FRAMEWORK MATERIAL: ENHANCED SELECTIVITY, STABILITY, COMPATIBILITY, AND PROCESSABILITY



THE OPPORTUNITY

This patent offers a modified version of HKUST-1 (aka CuBTC), one of the most studied metal-organic frameworks (MOFs). The improved version incorporates a mixed linker strategy that (1) enhances compatibility with various polymers, and (2) increases stability of the material towards moisture, and (3) increases selectivity towards certain chemicals.

THE BACKGROUND

MOFs are synthesized using a combination of metal/metal clusters and organic ligands to form 3-dimensional structures. Often having very high porosity and surface area, these materials can be tuned to target specific toxic chemicals and biologicals by changing metal type, linker connectivity, and/or linker functionality.

THE TECHNOLOGY

Incorporating 2-aminoisophthalic acid along with 1,3,5-benzene tricarboxylic acid (BTC), a mixed-linker MOF was developed that is isostructural to CuBTC. The material can be used in various applications, including filtration and gas storage. The use of a mixed-linker system resulted in enhanced stability towards moisture as well as better compatibility with various polymers, ultimately leading to better mechanical properties. Varying amounts of linkers can be added to give a variety of properties. The amine group in the MOF can be modified to incorporate a variety of functional groups, further tuning behavior for specific applications.

THE BENEFIT

New technologies can be developed for filtration, protective suits, gas storage, and more based on this new framework. The added stability and compatibility with polymers opens the door to applications for which CuBTC MOF would not be appropriate due to stability issues.

WHO WE ARE:

The U.S. Army Combat Capabilities Development Command Chemical Biological Center (DEVCOM CBC) is the primary Department of Defense technical organization for non-medical chemical and biological defense.

WHY DEVCOM CBC:

DEVCOM CBC has a unique role in technology development that cannot be duplicated by private industry or research universities. CBC fosters research, development, testing, and application of technologies for protecting warfighters, first responders and the nation from chemical and biological warfare agents.

FOR MORE INFORMATION ON THIS OPPORTUNITY:

DEVCOM CBC Office of Research and Technology Applications

CONTACT:

usarmy.apg.devcom-cbc.mbx.technology-transfer-office@army.mil

PATENT NUMBER: 11.987,594

