METAL-ORGANIC FRAMEWORKS FOR AROMATIC HYDROCARBON SEPARATIONS

Tech ID: 24676 / UC Case 2015-082-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,118,877	11/06/2018	2015-082

BRIEF DESCRIPTION

Nearly all hydrocarbons are generated from petroleum or natural gas processing. Hydrocarbon mixtures are separated into component fractions at scale for the commercial production of fuels and chemical feedstocks. These large-scale systems use a lot of energy and require many sub-systems with expensive adsorbents or membrane materials like zeolites, polymers, metal oxides, and carbon. Since many of these hydrocarbon mixtures have molecules with similar structures, properties, and reactivities, many of the technical challenges and associated high costs remain. Metal-organic frameworks (MOFs) hold promise for efficient and complex separations based on their desirable surface areas, tunable pore geometries, and adjustable surface functionality. To help align MOFs with challenges in hydrocarbon separations, researchers at UC Berkeley have developed thermally robust and tunable MOF materials which are capable of separating mixtures of saturated, unsaturated, and aromatic hydrocarbons. The researchers have demonstrated the purification of a four component gas-phase mixture.

SUGGESTED USES

- Industrial liquid- and gas-phase separation
- Purification of individual components of aromatic hydrocarbons

ADVANTAGES

- Broad range of aromatic hydrocarbon separation applications
- Thermally stable and tunable to pore shape and geometry
- Reduces overall system energy requirements

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Next-Generation Metal-Organic Frameworks With High Deliverable Capacities For Gas Storage Applications
- Structures and Apparatus using Three-Dimensional Linked Networks
- Gas Separations With Redox-Active Metal-Organic Frameworks
- Novel Porous Organic Polymers for Ammonia Adsorption
- Isothermal Carbon Capture And Release Of Carbon Dioxide With Molecular Polyamines
- Metal-Organic Frameworks for H2 Adsorption and Drug Delivery
- Redox-Active Metal-Organic Frameworks for the Catalytic Oxidation of Hydrocarbons

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OTHER INFORMATION

CATEGORIZED AS

- **Energy**
  - Hydrocarbon
- **Materials & Chemicals**
  - Chemicals
  - Composites

RELATED CASES

2015-082-0

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