

ZIFs Based on Ring Carbonyl Containing Imidazoles and Their Synthesis

CLAIM:

New subclass of ZIF that exhibits prominent increase in CO₂ adsorption capacity and selectivity.

NOVELTIES:

Application of ring carbonyl containing imidazoles as linkers in synthesis of metal-organic framework type gas adsorbents with tailorable pore properties and topology.

FEATURES:

- High chemical and thermal stability.
- Higher affinity toward adsorption of CO₂ compared with their isostructural ZIFs.
- Higher selectivity to separate CO₂

POTENTIAL APPLICATIONS:

- Power plants
- Chemical plants
- Coal gasification electric power plants
- Crude oil refining companies
- Petrochemical plants
- Hydrogen plants
- Oil refineries
- Natural gas treatment

MARKET SIZE:

The technology focuses on post combustion capture, allowing the CO₂ to be removed after the combustion of fossil fuels. According to the EPA, CO₂ emissions in the United States increased 7% from 1990 to 2013 and are projected to increase 1.5% by 2020.

POTENTIAL MARKETS:

- CO₂ capture
- CO₂ storage
- CO₂ transport
- Gas separation
- Catalysis

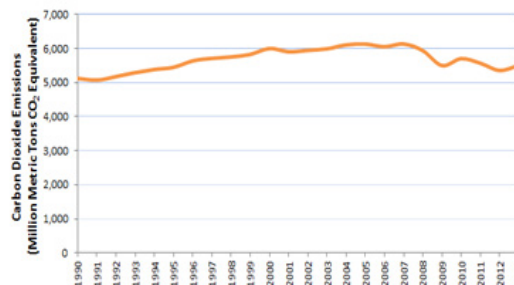


Figure 1- Source: United States Environmental Protection Agency.

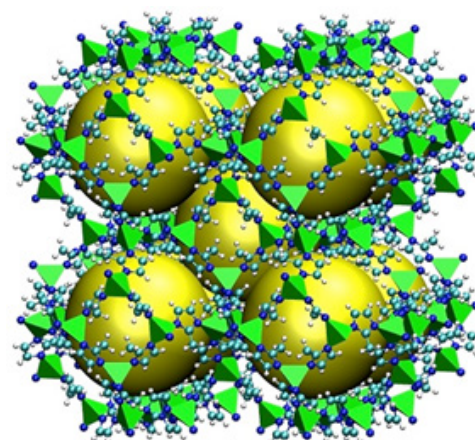


Figure 2- Source: National Institute of Standards and Technology

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