



# Gas hydrates produced under 'space' conditions

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## **Gas hydrates produced under 'space' conditions-IIT-Madras team achieves a rare feat**

- Researchers at Indian Institute of Technology (IIT) Madras have experimentally shown that methane and carbon dioxide (CO<sub>2</sub>) can exist as gas hydrates at temperatures and pressures seen in interstellar atmosphere.
- Gas hydrates are formed when a gas such as methane gets trapped in well-defined cages of water molecules forming crystalline solids.
- In terrestrial conditions, gas hydrates are formed naturally under the sea bed and glaciers under high pressure, low temperature conditions.
- Methane hydrate is a potential source of natural gas.
- The methane and CO<sub>2</sub> hydrates were produced in the lab at very low pressures (ten thousand billionth of atmospheric pressure) and temperature (as low as -263 degree C) to simulate the conditions of deep space.

### **Applications**

- The carbon dioxide hydrate produced in the lab raises the possibility of sequestering or storing carbon dioxide as hydrates by taking advantage of ice existing in environmental conditions favourable for hydrate formation.
- In these environments, the carbon dioxide will have enough energy to interact with ice.
- So both molecules will have enough mobility to allow interaction to form carbon dioxide hydrate.
- IIT Madras, in collaboration with GAIL, is working to recover methane from methane hydrate from the Krishna-Godavari Basin and sequester CO<sub>2</sub> simultaneously.



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