Nobel Prize in Chemistry 2025

Prelims: *Current events of national and international importance | Awards*

- The Nobel Prize in Chemistry 2025 honors 3 scientists who expanded that horizon into a whole new dimension.
- **Awardees**
    1. Susumu Kitagawa,
    2. Richard Robson and
    3. Omar Yaghi
- **Given by -** Royal Swedish Academy of Sciences.
- **Prize money -** The 3 winners will share prize money of 11 million Swedish kronor (£872,000).
- **Purpose -** The scientists' work is about how molecules can be built together into structures - or ***Metal-Organic Frameworks (MOFs).***
- The scientists' work could tackle some of the biggest problems on our planet, including capturing carbon dioxide to help tackle climate change and reducing plastic pollution using chemistry.

Metal-Organic Frameworks (MOFs)

• MOFs are crystalline structures in which metal ions serve as nodes and organic molecules as connectors.
• The resulting structure can have enormous internal surface areas, thousands of square metres per gram and their pores can be customised to attract or hold specific molecules.
• Chemists classify MOFs as part of a larger family called coordination networks but their hallmark is tuneable porosity.
• By carefully choosing the building blocks, researchers can control the size and shape of the cavities and the chemical environment within.
• As a result, MOFs are among the most versatile materials ever created.

- They worked out how to build constructions with large spaces between the molecules, through which gases and other chemicals can flow.
- These rooms can be used to capture and store chemicals that humans want to get rid of, including carbon dioxide in the atmosphere or per- and polyfluoroalkyl substances (PFAS).

Reference

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