

ISRO making green propellant

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Context: Scientists at the Indian Space Research Organisation (ISRO) have reported progress in the development of an environment-friendly propellant to power satellites and spacecraft. The new propellant is a blend based on hydroxylammonium nitrate (HAN).

About the new propellant:

- The new HAN-based monopropellant is already being tested. **A monopropellant is a chemical propulsion fuel which does not require a separate oxidizer. It is used extensively in satellite thrusters for orbital correction and orientation control.**
- The in-house formulation consists of HAN, ammonium nitrate, methanol and water. While methanol was added to reduce combustion instability, the choice of AN was dictated by its capacity to control the burn rate and lower the freezing point of the propellant.

Need for a new propellant:

Presently, hydrazine rocket fuel is being used. However, it is a highly toxic and carcinogenic chemical. Due to its high performance characteristics, hydrazine has dominated the space industry as the choice of propellant for over six decades, despite its environment and health hazards and the challenges faced in its manufacturing, storage, ground handling and transportation.

To be looked in UPSC Paper 3 Topic : Indigenization of technology and developing new technology.