# New aqueous electrolyte

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**In news–** Scientists from Institute of Nano Science and Technology (INST) Mohali, an autonomous institute of Department of Science and Technology (DST), have introduced a new electrolyte called (NaBF4) recently.

**About new electrolyte-**

- **A new aqueous electrolyte can help make electrochemical ammonia synthesis more efficient** will be **useful for industries producing green energy or hydrogen.**
- The electrochemical ammonia synthesis is largely limited by the poor solubility of nitrogen (N2) in the aqueous electrolyte environment as well as the competitive hydrogen evolution reaction.
- **The obstacle faced was that reduction of N2 has actually occurred in the aqueous medium**. In an attempt to solve these issues, the "ambient" conditions are mostly overseen.
- Researchers mostly work on catalyst development, while electrolyte improvisation still remains in infancy.
- According to a recent report, 90.7 % of the research works related to : Nitrogen reduction reaction (NRR) have focused on the suitable catalyst development, while only 4.7 % have been devoted to work on the electrolytes.
- Scientists from INST Mohali have introduced a **new electrolyte called (NaBF4), which not only acts as an N2-carrier in the medium** but **also works as a full-fledged "co-catalyst"** along with active material transition metal-doped nanocarbon (MnN4) to deliver high yield of ammonia (NH3) at absolutely ambient experimental conditions.
- The high production rate of NH3 approached industrial scale and exceeded almost all the standard catalysts in

any other electrolyte medium.

- The source of $NH_3$ was thoroughly studied and confirmed to be chiefly from the electrochemical reduction of the purged $N_2$ gas (make it $N_2$ saturated electrolyte to convert $N_2$ to $NH_3$).
- **This research is a novel approach to get through the long-standing issues about the solubility of $N_2$ in aqueous medium** and achieve industrial scale production rate of ammonia by NRR at ambient condition.