

Electrocoagulation for wastewater treatment

June 14, 2021

In news

Small and medium scale enterprises to get Electrocoagulation for wastewater treatment soon.

Electrocoagulation & Electroflotation for wastewater treatment

- The technology was developed by Dr Chiranjib Bhattacharjee, Professor at the Chemical Engineering Department in Jadavpur University, Kolkata.
- It uses a combination of Electrocoagulation and Electroflotation Enhanced Membrane Module (ECEFMM) techniques for wastewater treatment.

Electrocoagulation is a waste water treatment technique that uses electrical charge for changing the particle surface charge, allowing suspended matter to form aggregates.

Electroflotation is the separation of suspended particles from water using hydrogen and oxygen bubbles generated by passing electricity through water

- In the developed module, electrocoagulation and electroflotation are adjoined with membrane in a single indigenous setup.
- The turbulence created because of the hydrogen bubbling through the feed medium or the waste-water resists the deposition of oil over the membrane.
- The synergistic effect of hydrogen bubbling and rotation of the membrane module creates substantial turbulence within the solution and on the membrane surface.
- This technology developed with support from the Advanced Manufacturing Technologies programme of the Department

of Science & Technology (DST), Government of India

What was the practice so far?

So far, the separation technology running in different sectors for treating such oily waste water involves the installation of an electrolytic cell or DAF followed by membrane unit. However, installing two separate units requires a high footprint area compared to the present unit, where two-unit operations are being assimilated in a single unit



Benefits of this technology

- On application of electric field during membrane separation, membrane fouling is substantially reduced, and **membrane longevity** is also enhanced by restricting the membrane ageing for a prolonged time period.
- Thus, it requires **less frequent membrane replacement**, thereby reducing the maintenance costs to a great extent.
- The innovation being an **economically feasible** wastewater treatment technology (both in terms of capital and recurring investment) for low-scale and medium enterprises, has a good market potential.
- Unlike other conventional treatment, **it can break the highly stable oil-water emulsion through electric discharge** and simultaneously **separates oil from water with high efficiency**.
- Besides, by integrating the electrochemical process setup with the membrane module in a single hybrid ECEFMM setup, one process has been eliminated.

- **It requires minimal manpower** and does not need high-end technical adequacy for its operation, thus reducing the operational expense to a large extent.
- This significantly lowers the initial capital investment expense along with the additional advantage of reduced installation area requirement.
- **The recovered spent oil after oily wastewater treatment can be further used** as an industrial burner oil, furnace oil, mould oil, hydraulic oil and so on.
- Thus, it creates a **huge revenue generation scope** for low-income groups by selling this collected spent oil.