

Sub Name: PRINCIPLES OF FOOD ENGINEERING

Sub Code: BVFPS202

*Prepared by **Sucheta Sahoo** (Assistant Professor)*

Department of food processing

Mugberia Gangadhar Mahavidyalaya

ELECTRODIALYSIS

Electrodialysis (ED) is used to transport salt ions from one solution through ion-exchange membranes to another solution under the influence of an applied electric potential difference. This is done in a configuration called an electrodialysis cell. The cell consists of a feed (dilute) compartment and a concentrate (brine) compartment formed by an anion exchange membrane and a cation exchange membrane placed between two electrodes. In almost all practical electrodialysis processes, multiple electrodialysis cells are arranged into a configuration called an electrodialysis stack, with alternating anion and cation exchange membranes forming the multiple electrodialysis cells. Electrodialysis processes are different from distillation techniques and other membrane based processes (such as reverse osmosis (RO)) in that dissolved species are moved away from the feed stream rather than the reverse.

Applications

- Large scale brackish and seawater desalination and salt production.
- Small and medium scale drinking water production (e.g., towns & villages, construction & military camps, nitrate reduction, hotels & hospitals)
- Water reuse (e.g., desalination brine treatment, industrial laundry wastewater, produced water from oil/gas production, cooling tower makeup & blowdown, metals industry fluids, wash-rack water)
- Pre-demineralization (e.g., boiler makeup & pretreatment, ultrapure water pretreatment, process water desalination, power generation, semiconductor, chemical manufacturing, food and beverage)
- Food processing
- Agricultural water (e.g., water for greenhouses, hydroponics, irrigation, livestock)
- Glycol desalting (e.g., antifreeze / engine-coolants, capacitor electrolyte fluids, oil and gas dehydration, conditioning and processing solutions, industrial heat transfer fluids, secondary coolants from heating, venting, and air conditioning (HVAC))
- Glycerin purification