

Chapter Reverse Osmosis

Electrodialysis

distillation techniques and other membrane based processes (such as reverse osmosis (RO)) in that dissolved species are moved away from the feed stream

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...

International Humic Substances Society

and peat, plus natural organic matter isolated from river water by reverse osmosis, without fractionation. These standards, which represent an important

The International Humic Substances Society is a scientific society with a focus on research into natural organic matter (NOM) in soil and water.

Brine

out, among others. The discharge of desalination plants by seawater reverse osmosis (SWRO), are mainly characterized by presenting a salinity concentration

Brine (or briny water) is a high-concentration solution of salt (typically sodium chloride or calcium chloride) in water. In diverse contexts, brine may refer to the salt solutions ranging from about 3.5% (a typical concentration of seawater, on the lower end of that of solutions used for brining foods) up to about 26% (a typical saturated solution, depending on temperature). Brine forms naturally due to evaporation of ground saline water but it is also generated in the mining of sodium chloride. Brine is used for food processing and cooking (pickling and brining), for

de-icing of roads and other structures, and in a number of technological processes. It is also a by-product of many industrial processes, such as desalination, so it requires wastewater treatment for proper disposal or further...

Lilia Ann Abron

Iowa. Her thesis focused on reverse osmosis, and was titled: "Transport Mechanism in Hollow Nylon Fiber Reverse Osmosis Membranes for the Removal of

Lilia Ann Abron (born March 8, 1945) is an American entrepreneur and chemical engineer. In 1972, Abron became the first African American woman to earn a PhD in chemical engineering.

Sydney Desalination Plant

Sydney in the Australian state of New South Wales. The plant uses reverse osmosis filtration membranes to remove salt from seawater and is powered using

The Sydney Desalination Plant also known as the Kurnell Desalination Plant is a potable drinking water desalination plant that forms part of the water supply system of Greater Metropolitan Sydney. The plant is located in the Kurnell industrial estate, in Southern Sydney in the Australian state of New South Wales. The plant uses reverse osmosis filtration membranes to remove salt from seawater and is powered using renewable energy, supplied to the national power grid from the Infigen Energy-owned Capital Wind Farm located at Bungendore.

The Sydney Desalination Plant is owned by the Government of New South Wales. In 2012, the NSW Government entered into a 50-year lease with Sydney Desalination Plant Pty Ltd (SDP), a company jointly owned by the Ontario Teachers' Pension Plan Board (50%) and two...

Membrane scaling

etc.) precipitate and form a dense layer on the membrane surface in reverse osmosis (RO) applications. Figures 1 and 2 show scanning electron microscopy

Membrane scaling is when one or more sparingly soluble salts (e.g., calcium carbonate, calcium phosphate, etc.) precipitate and form a dense layer on the membrane surface in reverse osmosis (RO) applications. Figures 1 and 2 show scanning electron microscopy (SEM) images of the RO membrane surface without and with scaling, respectively. Membrane scaling, like other types of membrane fouling, increases energy costs due to higher operating pressure, and reduces permeate water production. Furthermore, scaling may damage and shorten the

lifetime of membranes due to frequent membrane cleanings and therefore it is a major operational challenge in RO applications.

Membrane scaling can occur when sparingly soluble salts in RO concentrate become supersaturated, meaning their concentrations exceed their...

Distilled water

laboratories, as well as in industry, in some appliances, deionized water or reverse osmosis water can be used instead of distilled water as a cheaper alternative

Distilled water is water that has been purified by boiling it into vapor then condensing it back into liquid in a separate container. Impurities in the original water that do not boil below or near the boiling point of water remain in the original container.

Electrodialysis reversal

Periodically (3-4 times per hour), the direction of ion flow is reversed by reversing the polarity of the applied electric current. Current reversal reduces

Electrodialysis reversal (EDR) is an electrodialysis reversal water desalination membrane process that has been commercially used since the early 1960s. An electric current migrates dissolved salt ions, including fluorides, nitrates and sulfates, through an electrodialysis stack consisting of alternating layers of cationic and anionic ion exchange membranes. Periodically (3-4 times per hour), the direction of ion flow is reversed by reversing the polarity of the applied electric current.

Current reversal reduces clogging of membranes, as salt deposits in the membrane gets dissolved when the current flow is reversed. Electrodialysis reversal causes a small decrease in the diluted feed quality and requires increased complexity infrastructures, as reversible valves are required to change the flow...

Polyimide

a reverse osmosis water softener? wisegeek.net Shuey, Harry F. and Wan, Wankei (22 December 1983) U.S. patent 4,532,041 Asymmetric polyimide reverse osmosis

Polyimide (sometimes abbreviated PI) is a monomer containing imide groups belonging to the class of high-performance plastics. With their high heat-resistance, polyimides enjoy diverse applications in roles demanding rugged organic materials, such as high temperature fuel cells, displays, and various

military roles. A classic polyimide is Kapton, which is produced by condensation of pyromellitic dianhydride and 4,4'-oxydianiline.

Industrial wastewater treatment

required, either general membrane treatments like ultrafiltration or reverse osmosis or treatments to remove specific contaminants, such as nutrients. The

Industrial wastewater treatment describes the processes used for treating wastewater that is produced by industries as an undesirable by-product. After treatment, the treated industrial wastewater (or effluent) may be reused or released to a sanitary sewer or to a surface water in the environment. Some industrial facilities generate wastewater that can be treated in sewage treatment plants. Most industrial processes, such as petroleum refineries, chemical and petrochemical plants have their own specialized facilities to treat their wastewaters so that the pollutant concentrations in the treated wastewater comply with the regulations regarding disposal of wastewaters into sewers or into rivers, lakes or oceans. This applies to industries that generate wastewater with high concentrations of organic...

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