

Dr. Emanuel Korngold

Emeritus (2006)

Research interests

Dr. Korngold has been at Ben-Gurion University since 1968. His areas of research include:

- 1) *Ion-exchange - ion-exchange properties, selectivity, special uses, waste-water treatment;*
- 2) *Membranes - membranes for electrodialysis properties and special uses;*
- 3) *Electrodialysis – pretreatment and operation;*
- 4) *Pervaporation;*
- 5) *Ion-exchange hollow fibers.*



6) *Waste water treatment*

Selected recent publications 2010-2014

Competitive
Uncompetitive
Donation

1.

New bipolar membrane setup for high current densities

Bejerano, Tony Tuvia; **Korngold, Emanuel**; Messalem, Rami
Desalination and Water Treatment 08 (2014), . | Language: English, Database:

Limited affordable c.d. of ca. 0.2 A cm⁻² is a major drawback in bipolar membrane (BPM) electrodialysis technol. At higher current densities, the diffusion of water into the BPM interface between the anion and cation exchange layers becomes the rate-limiting step for the water dissociation process. The extended use of the BPM setup at such high current densities, however, results in dehydration of the membrane, an increase in its resistance, and irreversible damage to the BPM. A new exptl. setup intended to enable high current densities to be safely used is described. The setup comprises a BPM...

2.

Bromide recovery from aqueous streams

Korngold, Emanuel; Cohen, Mordechai; Freiberg, Mira Bergstein; Rubín, Sharon Krumbain
From PCT Int. Appl. (2014), WO 2014115133 A1 20140731. | Language: English, Database: CAPLUS

The invention relates to a process for recovering bromide from a halide-contg. aq. stream, comprising the steps of: providing a feed of halide-contg. aq. stream; contacting an anion-exchange resin with said feed, to form halide-loaded resin; treating said halide-loaded resin with a regenerant and subsequently with a rinse to produce, in succession, a chloride-rich soln., a mixed chloride/bromide soln., a bromide-rich soln. and an essentially halide-free soln.; directing said mixed chloride/bromide soln. to said feed; processing said bromide-rich soln. to recover one or more bromide products; a...

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3.

Pilot studies on high recovery BWRO-EDR for near zero liquid discharge approach

Oren, Y.; **Korngold, E.**; Daltrophe, N.; Messalem, R.; Volkman, Y.; Aronov, L.; Weismann, M.; Bouriakov, N.; Glueckstern, P.; Gilron, J.
Desalination (2010), 261(3), 321-330. | Language: English, Database:

A hybrid process combining reverse osmosis and electrodialysis has been

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shown to be effective in recovering 97-98% of brackish water as product water with chloride levels of 200 mg/L or less. Potential for scaling on the brine side of the electrodialysis unit was prevented by acidification, operating the electrodialysis in a reversal mode (EDR), and a side loop crystallizer which prevented buildup of scaling components. Settlers, inline microfiltration, and side-loop ultrafiltration kept suspended solids from returning to the EDR unit. This process was demonstrated in a series of more than ...

4.

WAIV - wind aided intensified evaporation for brine volume reduction and generating mineral byproducts

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Katzir, Lilach; Volkmann, Y.; Daltrophe, N.; **Korngold, E.**; Mesalem, R.; Oren, Y.; Gilron, Jack

Desalination and Water Treatment (2010), 13(1-3), 63-73. | Language: English, Database: CAPLUS

In this study bench pilot WAIV units (~ 1 m² evapn. area loaded on 0.17 m² footprint) were operated on two different desalination brines (RO and ED) as well as on a mineral brine conc. under arid conditions of the Negev Highlands.

The evapn. rate with the WAIV unit on these feeds often gave evapn. rates per footprint that were 10-fold or greater than the pan evapn. rate obtained from the local meteorol. station at Sde Boker. Desalination brines were concd. up to 23% TDS when operating on ED conc. The evapn. from the WAIV unit demonstrated enrichment in the Mg ion compared to the Ca and the ...

5.

Electrodialysis of brine solutions discharged from an RO plant

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Korngold, E.; Aronov, L.; Daltrophe, N.

Desalination (2009), 242(1-3), 215-227. | Language: English, Database: CAPLUS

Electrodialysis (ED) expts. were carried out on RO brine solns., satd. with CaSO₄ and or silica with the aim to increase their concns. from 1.5 to 10%, thus reducing both effluent vol. and disposal costs. A pilot plant ED unit was built in which the brine circulating through the ED brine cells passed through a sep. CaSO₄ precipitator contg. gypsum seeds. The feed to the ED unit was the brine discharged from the RO unit, which was operating on brackish water from Mashabei-Sadeh. The salt concn. of the ED feed was reduced to 18-20 mN and was then mixed with the RO permeate.