

PILOT TRIALS OF WHEY DEMINERALIZATION

Optimal design of electro dialysis application on whey demineralization needs to be based on data obtained on real feed, because whey differs from plant to plant. Fully equipped pilot scale unit is used for estimation of product composition as well as determination of electro dialysis unit capacity.

RESULTS OF PILOT TRIALS

- composition of diluate (product) and concentrate (brine)
- losses of valuable products (lactose and proteins)
- data for scale up to industrial size electro dialysis unit
- specific consumption of water, electricity and chemicals

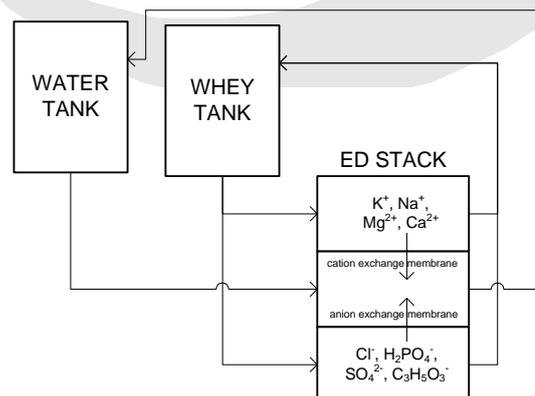


Fig. 1: Electro dialysis process scheme

PROCESS CONDITIONS

Equipment	pilot unit P1 EDR-Y/50-0.8
Feed	natural whey or whey concentrated by evaporation, reverse osmosis or nanofiltration
Product	demineralized whey with 4, 2.5 or 1% ash in dry matter which correspond to powders DWP-50, DWP-70 or DWP-90 after drying, pH adjustment by ammonium, sodium or potassium hydroxide
Brine	milk salt solution, conductivity controlled by water dosing, pH adjustment by acid dosing
Mode	batch or feed-and-bleed
Working temperature	15°C

MEASURED PARAMETERS

Voltage, current, flow rates, diluate inlet and outlet conductivity and outlet pH, concentrate outlet conductivity and pH, initial and final weight of diluate and concentrate, weight of water added to concentrate, quantity of acid added to concentrate, quantity of chemicals added to diluate for product pH adjustment.

EXAMPLE OF A SCHEDULE OF PILOT TRIAL COMBINED WITH TRAINING

1 st day	Installation of the pilot ED unit, chemical cleaning and sensor calibration (test preparation). Short adjustment test (goal: specification of final demineralization level).
2 nd day	Evaluation of final demineralization level (2 batches + cleaning = 12 h operation).
3 rd – 4 th day	2 days of continuous testing (4 batches + cleaning = 24 h operation).
5 th day	Unit cleaning and conservation after pilot trials.