Supplementary Materials

Optimal Design of a Hydrolysis Sugar Membrane Purification System Using a Superstructure-based Approach

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Table S1. Flowrates in the NF membrane network for scenario 1 (t/h).

Unit	Inlet stream	Outlet stream
MF	Feed mixture = 3	To MR1 = 1; permeate product = 2
MR1	From MF = 1; freshwater = 2	To MR2 = 1; to MP1 = 2
MR2	From MR1 = 1; from MP1 = 2	To MR3 = 1; permeate product = 0.03; waste = 1.97
MR3	From MR2 = 1; from MP1 = 2	To MR4 = 1; to MP1 = 1.927; permeate product = 0.052; waste = 0.021
MR4	From MR3 = 1; freshwater = 2	To MR5 = 1; MP1 = 2
MR5	From MR4 = 1; freshwater = 2	To MR6 = 1; MP1 = 2
MR6	From MR5 = 1; freshwater = 2	To MR7 = 1; MP1 = 2
MR7	From MR6 = 1; freshwater = 2	To MR8 = 1; MP1 = 2
MR8	From MR7 = 1; freshwater = 2	To MR9 = 1; MP1 = 0.073; permeate product = 1.927
MR9	From MR8 = 1; freshwater = 2	To MR10 = 1; permeate product = 0.142; waste = 1.858
MR10	From MR9 = 1; freshwater = 2	To MR11 = 1; permeate product = 0.14; waste = 1.86
MR11	From MR10 = 1; freshwater = 2	To MR12 = 1; permeate product = 0.019; waste = 1.981
MR12	From MR11 = 1; freshwater = 2	To MR13 = 1; permeate product = 0.139; waste = 1.861
MR13	From MR12 = 1; freshwater = 2	To MR14 = 1; permeate product = 2
MR14	From MR13 = 1; freshwater = 2	To MR15 = 1; permeate product = 2
MR15	From MR14 = 1; freshwater = 2	To MR16 = 1; permeate product = 0.029; waste = 1.971
MR16	From MR15 = 1; freshwater = 2	To MR17 = 1; permeate product = 0.014; waste = 1.986
MR17	From MR16 = 1; freshwater = 2	To MR18 = 1; permeate product = 0.014; waste = 1.986
MR18	From MR17 = 1; freshwater = 2	To MR19 = 0.763; retentate product = 0.237; permeate product = 0.014; waste = 1.986
MR19	From MR18 = 0.763; freshwater = 2.237	Retentate product = 1; permeate product = 0.014; waste = 1.986
MP1	From MR units = 12	To MR units = 4; permeate product = 8

Table S2. Flowrates in the NF membrane network for scenario 2 (t/h).

Unit	Inlet stream	Outlet stream
MF	Feed mixture = 3	To MR1 = 1; permeate product = 2
MR1	From MF = 1; from MP1 = 0.191; freshwater = 1.809	To MR2 = 1; waste = 2
MR2	From MR1 = 1; from MP1 = 0.027; freshwater = 1.973;	To MR3 = 1; waste = 2
MR3	From MR2 = 1; from MP1 = 0.459; freshwater = 1.541;	To MR4 = 1; to MP1 = 0.869; permeate product = 0.566; waste = 0.566
MR4	From MR3 = 1; from MP1 = 2	To MR5 = 1; to MP1 = 1.334; waste = 0.666
MR5	From MR4 = 1; from MP1 = 1.634; freshwater = 0.366;	To MR6 = 1; to MP1 = 2
MR6	From MR5 = 1; from MP1 = 1.089; freshwater = 0.911;	To MR7 = 1; to MP1 = 2
MR7	From MR6 = 1; freshwater = 2;	To MR8 = 1; to MP1 = 2
MR8	From MR7 = 1; freshwater = 2;	To MR9 = 1; to MP1 = 2
MR9	From MR8 = 1; freshwater = 2;	To MR10 = 1; to MP1 = 2
MR10	From MR9 = 1; freshwater = 2;	To MR11 = 1; to MP1 = 2
MR11	From MR10 = 1; freshwater = 2;	To MR12 = 1; to MP1 = 2
MR12	From MR11 = 1; freshwater = 2;	To MR13 = 1; permeate product = 2
MR13	From MR12 = 1; freshwater = 2;	To MR14 = 0.913; retentate product = 0.087; permeate product = 2
MR14	From MR13 = 0.913 freshwater = 2.087;	Retentate product = 1; permeate product = 2
MP1	From MR units = 16.203	To MR units = 5.401; permeate product = 10.802

Table S3. Flowrates in the NF membrane network for scenario 3 (t/h).

Unit	Inlet stream	Outlet stream
MF	Feed mixture = 3	To MR1 = 1; permeate product = 2
MR1	From MF = 1; from MP1 = 2	To MR2 = 1; to MP1 = 0.273; waste = 1.727
MR2	From MR1 = 1; from MP1 = 0.478; freshwater = 1.522	To MR3 = 1; to MP1 = 2
MR3	From MR2 = 1; freshwater = 2	To MR4 = 1; to MP1 = 2
MR4	From MR3 = 1; freshwater = 2	To MR5 = 1; to MP1 = 2
MR5	From MR4 = 1; freshwater = 2	To MR6 = 1; to MP1 = 1.16; waste = 0.84
MR6	From MR5 = 1; freshwater = 2	To MR7 = 1; permeate product = 1.84; waste = 0.16
MR7	From MR6 = 1; freshwater = 2	To MR8 = 1; waste = 2
MR8	From MR7 = 1; freshwater = 2	To MR9 = 0.599; retentate product = 0.401; waste = 2
MR9	From MR8 = 0.599; freshwater = 2.401	To MR10 = 1; waste = 2
MR10	From MR9 = 1; freshwater = 2	Retentate product = 1; waste = 2
MP1	From MR units = 7.433	To MR units = 2.478; permeate product = 4.955