Suplementary information

August 24, 2018

1 Clean water fluxes membrane sheets

Clean water fluxes for the membrane sheets used in the membrane filtration experiments.

NaCl concentration	Experiment 1 (L/m^{2}h)	Experiment 2 (L/m^{2}h)
1 mM	251	209
10 mM	227	232
100 mM	174	179

Table 1: Flux recovery and oil retention at 48 kg/h and 1 bar TMP.

2 Extraction protocol permeate analysis

Materials

- Separating funnel, glass, 50 mL, with stopper
- Collection bottle, glass, 10-20 mL, with screw cap
- Beaker, glass, 50 mL
- Funnel, glass
- Folding filters, 110 mm, 595
- Custom made funnel rack, polypropylene
- LC/GC vials, amber glass, 1.5 mL, with screw cap
- Multipette, Eppendorf
- Multipette tips, 25 mL, with adapter
- Pipette, Eppendorf, 10 mL and 5000 μL
- Pipette tips, 10 mL and 5000 μL

Chemicals

- n-Hexane
- Pentadecane (C15) stock solution, 996 ppm in hexane
- Milli-Q water
- Silica

Procedure

1. Rinse as many separating funnels as needed with n-hexane. Collect the waste in waste category 3 (organic chemicals).
2. Place the separating funnels in the custom made funnel rack and mark the funnels.
3. Pipette 5 mL of sample in a separating funnel. Add 1 mL of C15 stock solution using a pipette and homogenize through gentle mixing. Then add 4 mL of MQ-water and homogenize again.
4. Attach a tip to the Multipette using the adapter and fill the tip with n-hexane. Set the dispensing volume to 4 mL using the numbered dial (setting number 8). Dispense the first amount into the waste or back into the n-hexane.
5. Dispense 4 mL in each separating funnel and close the funnels using the stopper.
6. Invert the stoppered funnel and shake for approximately 5-10 seconds. While in inverted position, slowly open the valve of the funnel to release excess pressure. Close the valve after venting.
7. Repeat step 6 another two times.
8. Place the funnel upright in the rack and leave for a few minutes, allowing phase separation to occur. Foam may be present on the top layer but this will not harm the result in the end.
9. Upon completion of phase separation, place a marked clean glass beaker under each funnel and collect the lower (aqueous) liquid phase by slowly opening the valve of the funnel.
10. Collect the remaining extract - including the foam - in a marked bottle and close the bottle.
11. Transfer the collected aqueous phase from the glass beaker to the separating funnel, add 3 mL (dial setting number 6) of n-hexane and close the funnel using the stopper. Repeat steps 6 to 10 using the previously used glassware.
12. Repeat step 11 once more to complete the extraction.
13. Put the used separating funnels and beakers aside for cleaning.
14. Fold a paper filter and place in a funnel. Fill the filter with silica. Repeat as needed for all samples.
15. Place a clean marked bottle under each funnel and gently pour the extract over the silica filter to remove any polar contaminants. Close the bottle upon completion of the filtration.
16. Transfer approximately 1000-1500 μL of the filtrate to an amber glass LC/GC vial and cap using a screw cap. The sample is now ready for further GC analysis.