Comparison of Leached [DOC] for Different Syringe Filters

Table 1: Measured [DOC] for Filtered and Unfiltered MilliQ Samples

Filter	Rinsed filtered milliQ([DOC] in mg/L)	Un-rinsed filtered milliQ ([DOC] in mg/L)	Un-filtered milliQ ([DOC] in mg/L)
Pall Life Sciences (PN 4497T) Acrodisc 25mm syringe filters with 0.45um HT Tuffryn membrane, non-sterile, low-protein binding	2.512	9.724	0.0215
VWR (European article # 514-0074) 25mm syringe filters with 0.45 um polyethersulfone membrane, acrylic housing, non-sterile	0.235	0.386	

From the data found in Table 1 it is clear that the filters with a polyethersulfone membrane leach less DOC from the filters. The HT Tuffryn membrane filters were found to leach a significant amount of DOC comparatively, even after copious rinsing with milliQ (all rinsed samples were filtered through a filter pre-rinsed with 25mL of milliQ).

It is also worth noting that pre-rinsing the HT Tuffryn membrane filters with copious amounts of water made a significant difference in the amount of DOC leached from the filter. However, little difference was observed between the rinsed vs. un-rinsed samples when filtering with a polyethersulfone membrane.

Therefore polyethersulfone is the superior filtration membrane for DOC analysis as it leaches less DOC into water samples. It can also be said that neither filter is ideal for analysis of dilute DOC samples (<1mg/L), as ~0.2mg/L is leached into samples with copious rinsing.

From the following paper, it can be seen that polyethersulfone is among the best filtration media for DOC analysis, and should be rinsed with 100mL of milliQ before filtration for best results. The table below should be referred to for proper filter cleaning methods (Khan et. Al, 2007).

Table 5.

Summary of interference caused by organic leaching from filters on analyses and suggested cleaning method

Filter type	Interference in the analysis of				Suggested cleaning method
	DOC	COD	BOD	BDOC	
Gelman Versapor	Yes		N[a]	N[a]	Soak in 100 mL DDW for 24 h
Gelman GN-6	Yes			Yes	Soak in 100 mL DDW for 24 h
Gelman FP-Vericel	Yes	Yes	Yes	Yes	Soak in 100 mL DDW for 10 days
Gelman HT-Tuffryn	Yes	Yes	Yes	Yes	Soak in 100 mL DDW for 72 h
Gelman Nylaflo			N[a]	N[a]	Requires no pretreatment, however filter at least 100 mL of DDW before use for analysis
Millipore Nylon	Yes			Yes	Filter at least 150 mL of DDW before use for analysis
Osmonic Magna Nylon	Yes			I[b]	Filter at least 100 mL of DDW before use for analysis
Whatman Nylon	Yes			Yes	Soak in 100 mL DDW for 24 h
Gelman Supor 200	Yes		N[a]	N[a]	Soak in 100 mL DDW for 48 h
Gelman Supor 450			N[a]	N[a]	Requires no pretreatment, however filter at least 100 mL of DDW before use for analysis
Gelman Supor 800			N[a]	N[a]	Requires no pretreatment, however filter at least 100 mL of DDW before use for analysis
Whatman (WCN)	Yes			Yes	Soak in 100 mL DDW for 48 h
Whatman Nucleopore			N[a]	N[a]	Requires no pretreatment, however filter at least 100 mL of DDW before use for analysis
Gelman GH Polypro	Yes		Yes	Yes	Soak in 100 mL DDW for 48 h
Cellulose acetate (0.20 μm)	Yes			Yes	Soak in 100 mL DDW for 24 h
Cellulose acetate (0.45 μm)	Yes			Yes	Filter at least 150 mL of DDW before use for analysis
Whatman GF/F	Yes		N[a]	N[a]	Filter at least 150 mL of DDW before use for analysis
Gelman A/E	Yes			Yes	Soak in 100 mL DDW for 24 h
Whatman 934-AH			N[a]	N[a]	Requires no pretreatment, however filter at least 100 mL of DDW before use for analysis

a N—Not tested.

b I—Inconclusive.

Interferences contributed by leaching from filters on measurements of collective organic constituents

Khan, E.; Subramania-Pillai, S. Interferences contributed by leaching from filters on measurements of collective organic constituents. Water Res. 2007, Vol.41(9), pp.1841-1850.