

Supplementary Information

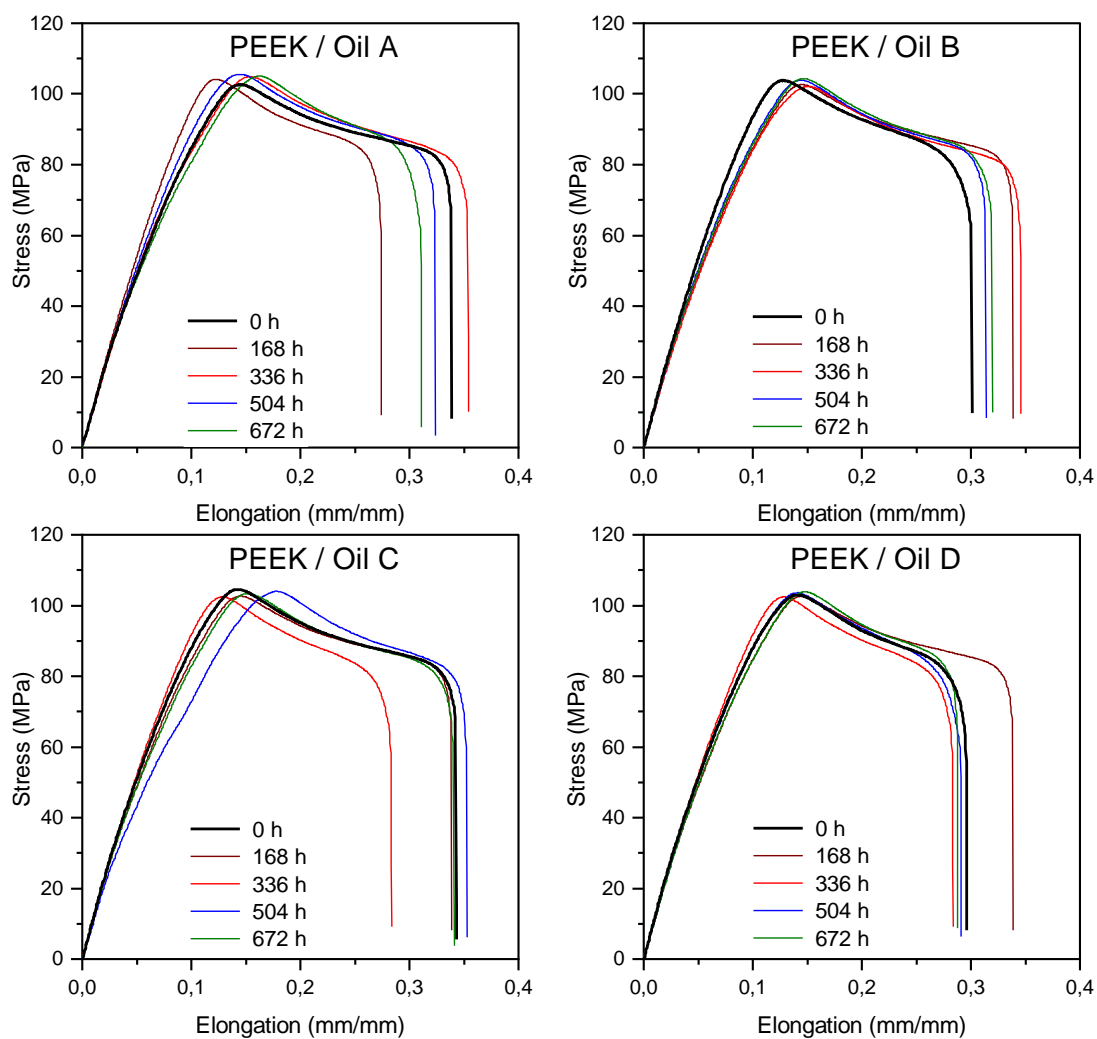


Figure S1. Tensile strength and elongation at break of the PEEK (fresh and after 168, 336, 504 and 672 h of ageing in the ATFs).

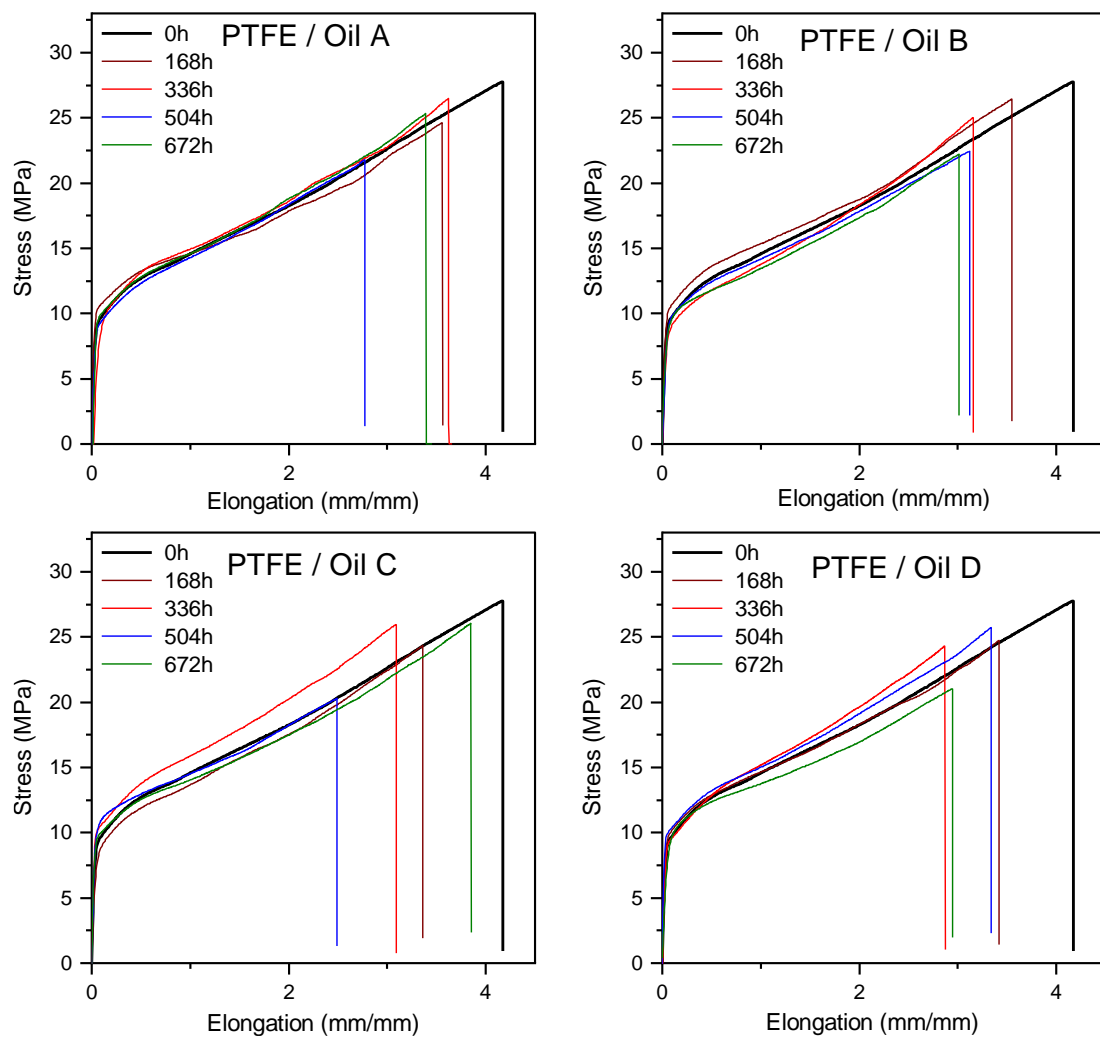


Figure S2. Tensile strength and elongation at break of the PTFE (fresh and after 168, 336, 504 and 672 h of ageing in the ATFs).

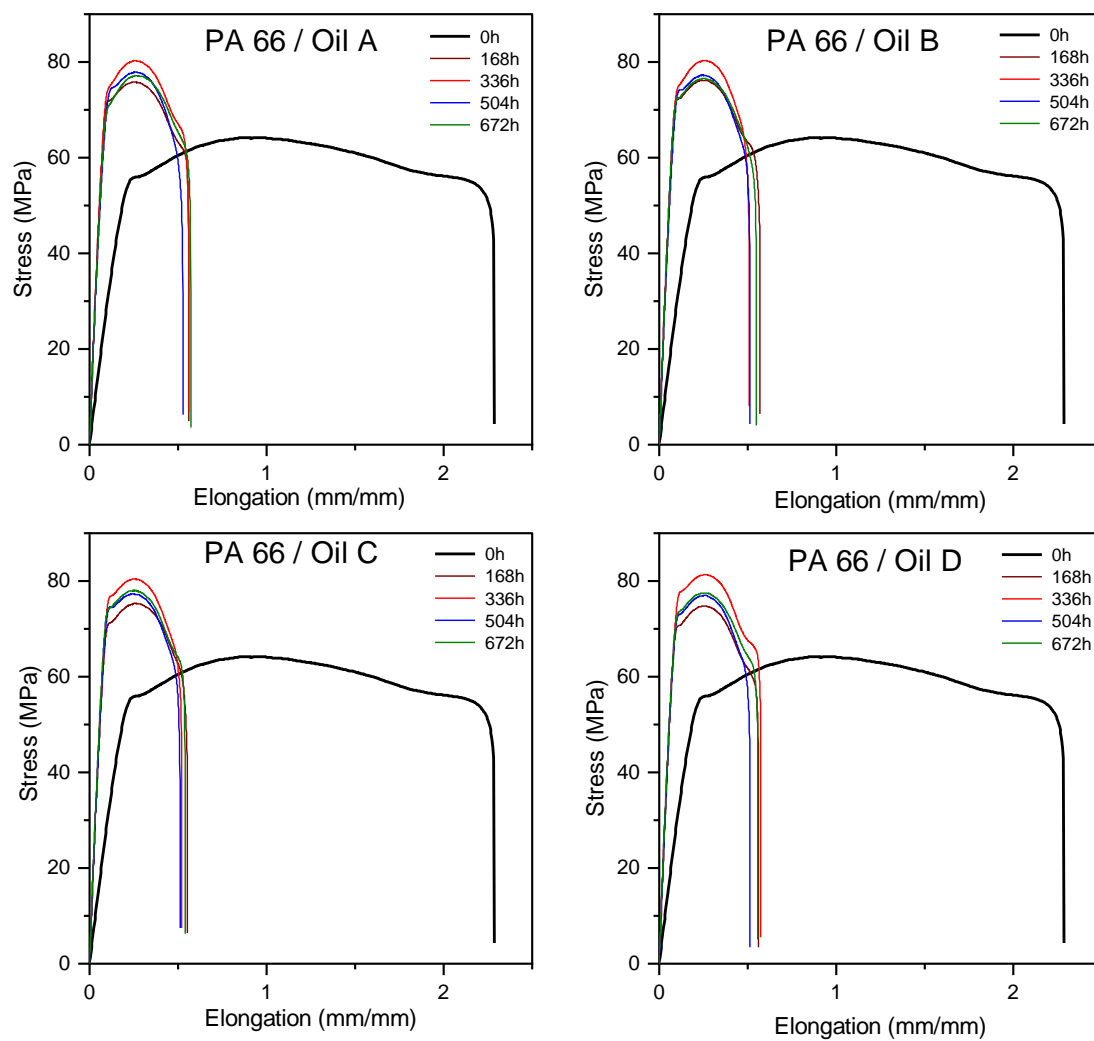


Figure S3. Tensile strength and elongation at break of the PA 66 (fresh and after 168, 336, 504 and 672 h of ageing in the ATFs).

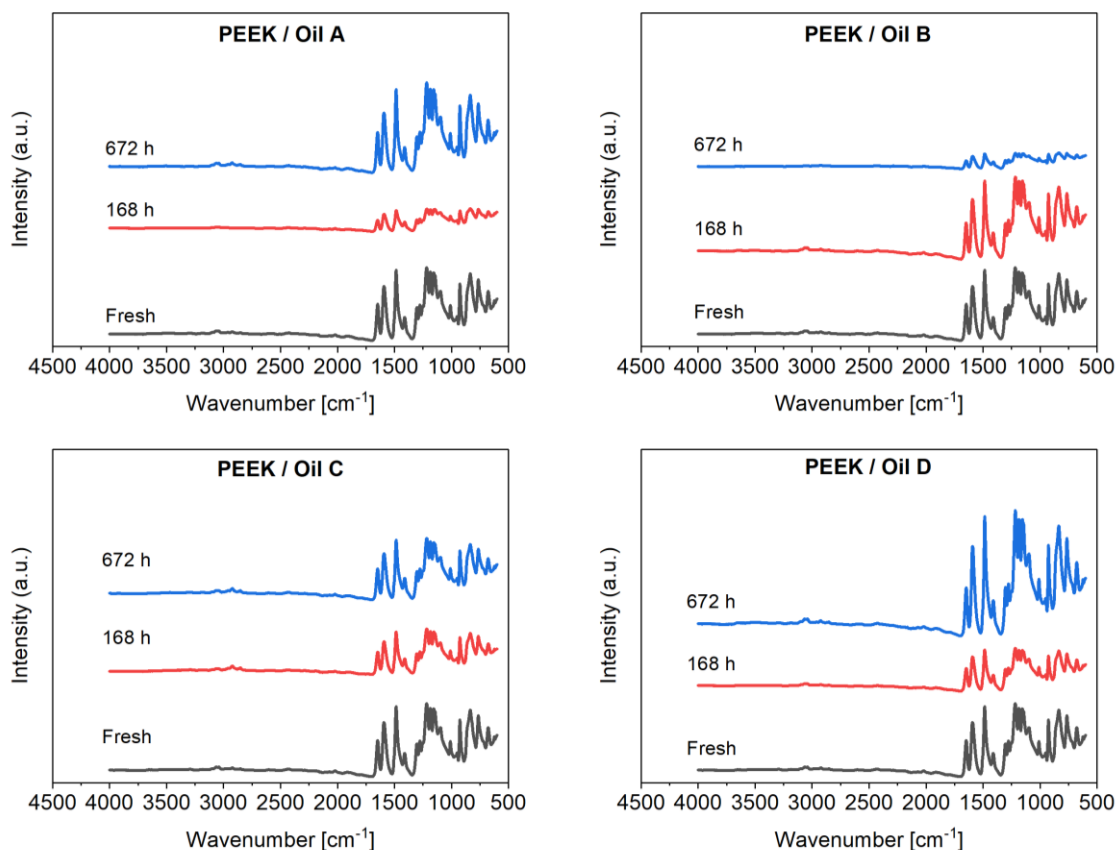


Figure S4. FTIR spectra of the PEEK (fresh and after 168 and 672 h of ageing in the ATFs).

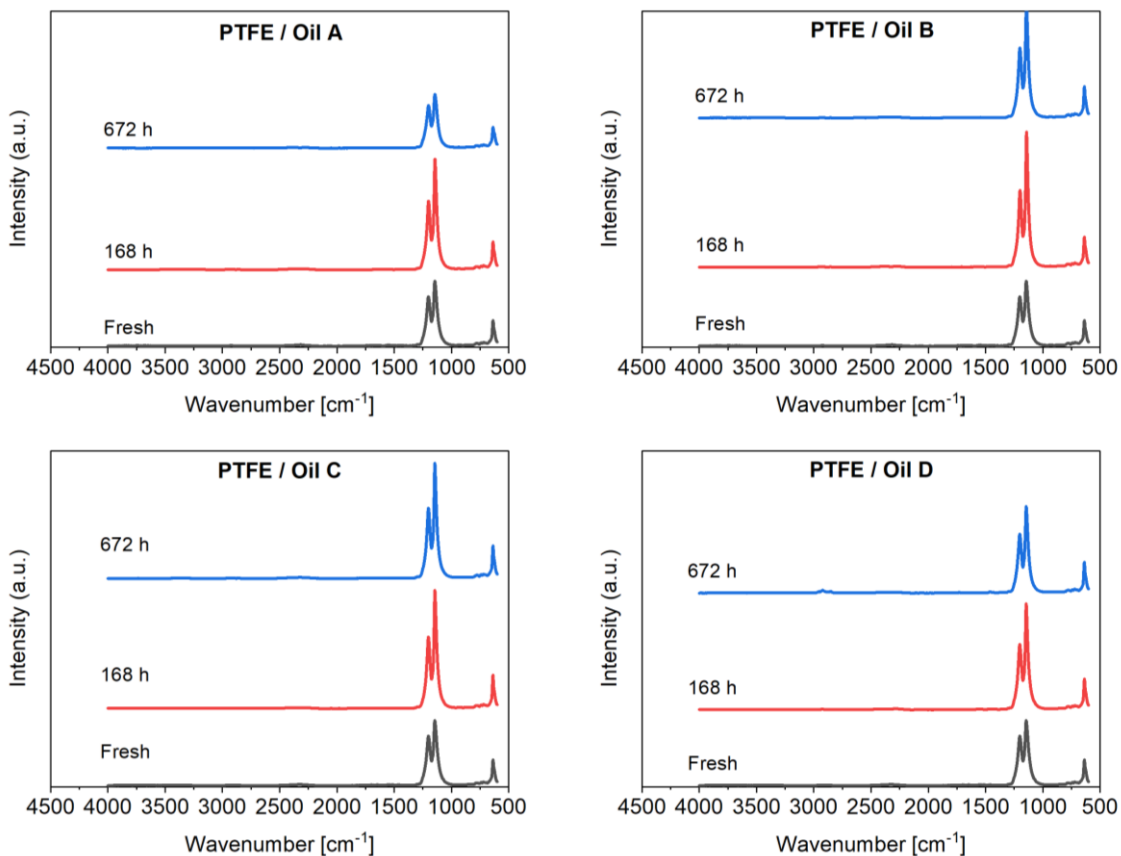


Figure S5. FT-IR spectra of the PTFE (fresh and after 168 and 672 h of ageing in the ATFs).

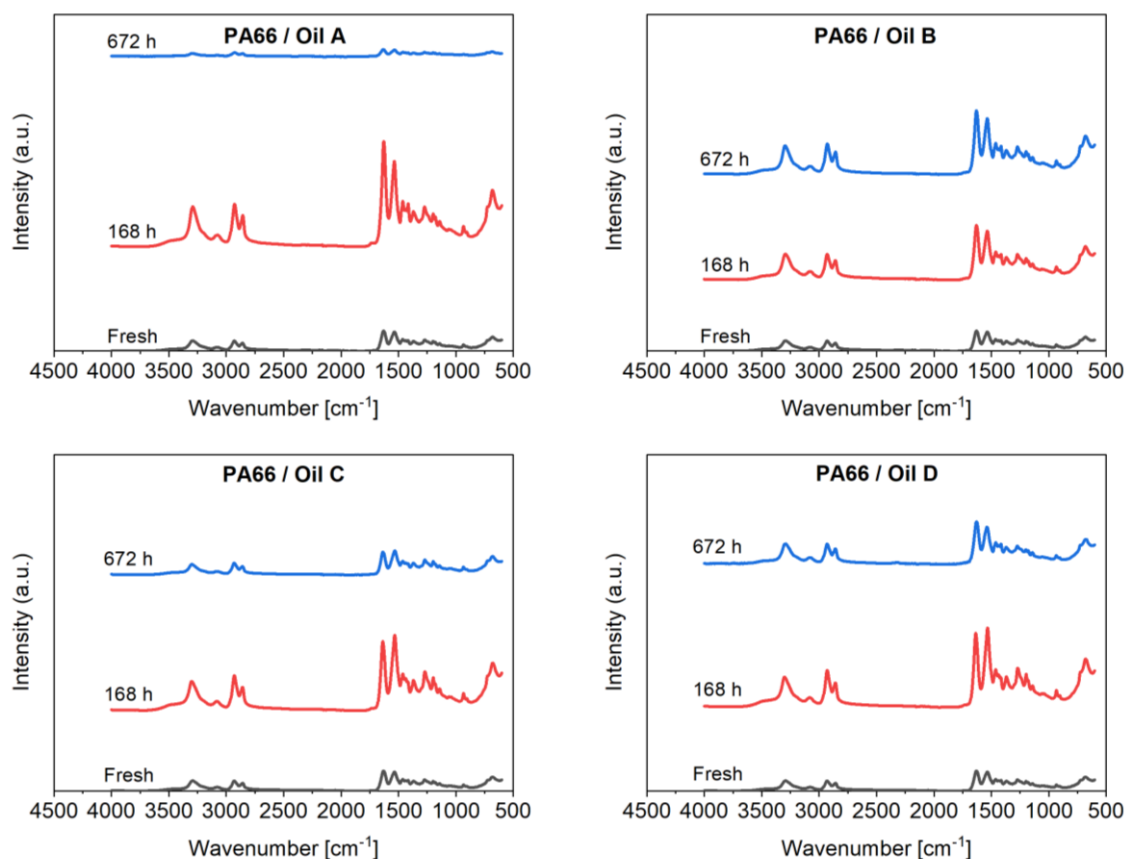


Figure S6. FT-IR spectra of the PA66 (fresh and after 168 and 672 h of ageing in the ATFs).

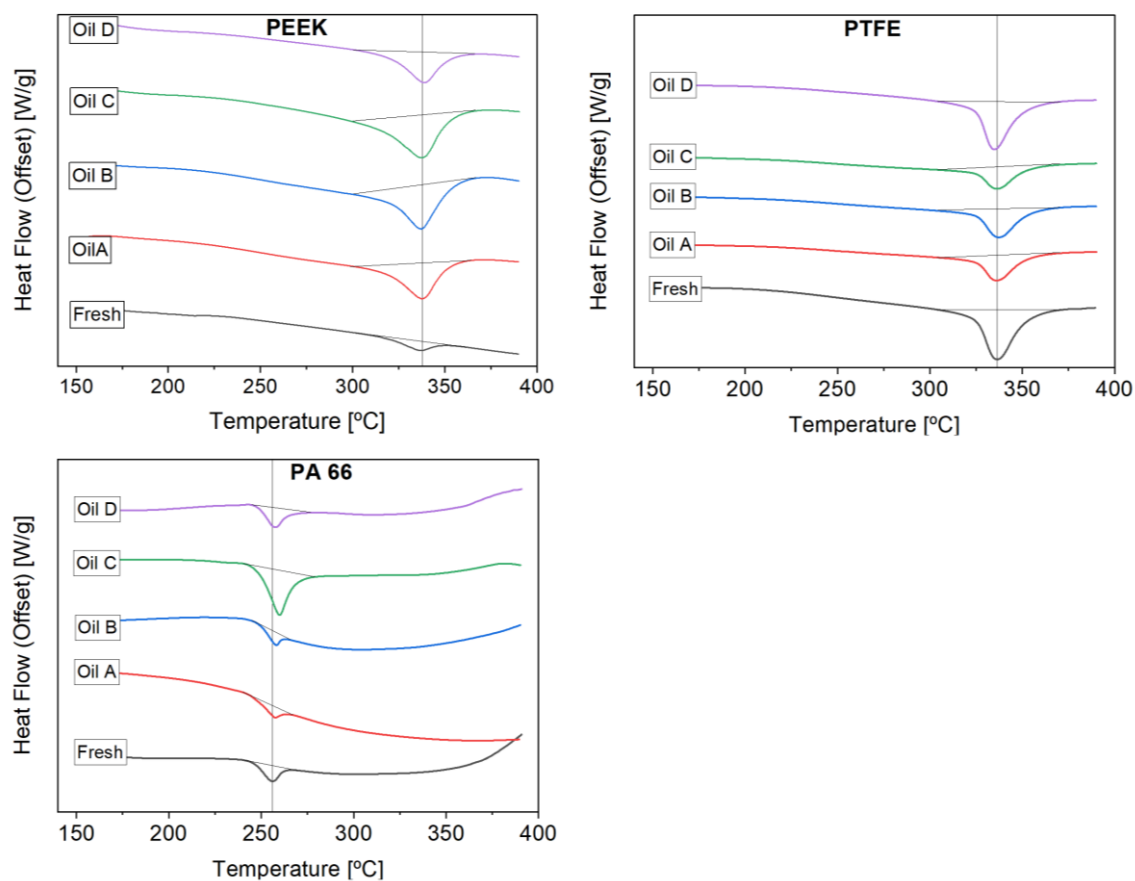


Figure S7. DSC results for the different material/oil combinations (Exo-up).

Tables S1, S2 and S3. Grubb's statistic for every peak ratio.
(we offer the estimation of every G value although it is meaningful only for the highest and lowest values).

Table S1. Grubb's statistic for every peak ratio for PEEK.

Peak limits / cm ⁻¹		Peak area								
From	To	Fresh	Oil A/168h	Oil A/672h	Oil B/168h	Oil B/672h	Oil C/168h	Oil C/672h	Oil D/168h	Oil D/672h
651.822	701.962	2.4631	0.6973	2.7784	2.5393	0.3782	1.3084	1.8391	1.4561	3.7724
701.962	788.743	6.0962	2.7784	7.0903	6.3468	1.0785	3.4472	4.7049	3.5333	9.6063
788.743	890.952	13.2138	3.6538	15.7539	13.9773	2.3881	7.7012	10.5431	7.6328	21.2228
890.952	939.164	4.1849	1.5212	4.8946	4.8683	1.0347	2.7359	3.6812	2.5695	6.521
939.164	979.661	0.6719	0.285	0.7087	0.7838	0.2058	0.4589	0.6059	0.4381	1.1218
979.661	1020.16	1.1202	0.4215	1.3087	1.3542	0.2694	0.7063	0.9694	0.7139	1.8093
1020.16	1122.37	1.7853	0.6138	1.9319	1.8641	0.3192	0.8951	1.2602	1.0551	2.9352
1122.37	1166.72	3.4398	0.8089	4.6683	3.8662	0.5329	1.9936	2.7073	1.6871	6.2532
1166.72	1197.58	1.8108	0.4444	2.4255	2.0291	0.3151	1.0677	1.4895	0.8747	3.318
1197.58	1263.15	5.3315	1.1894	7.1644	5.4384	0.8319	3.2843	4.2654	2.6927	8.0704
1263.15	1290.14	0.9149	0.3154	1.0441	1.072	0.2334	0.5928	0.8161	0.5661	1.4859
1290.14	1340.28	1.5923	0.5551	1.6899	1.7113	0.4059	0.962	1.3373	1.015	2.3092
1351.86	1430.92	1.8096	0.7155	1.9518	2.0546	0.5273	1.236	1.6902	1.231	2.6552
1430.92	1521.56	11.5901	3.8777	13.1767	12.9736	2.7643	7.2279	10.1336	7.284	18.6482
1521.56	1625.7	10.2166	3.5811	11.0347	11.3797	2.6191	6.2778	8.9805	6.5949	16.293
1625.7	1689.34	4.5536	1.4805	5.0694	4.6751	1.0461	2.8109	3.9225	2.8878	6.0596
2813.63	2883.06	0.0916	0.0133	0.1643	0.0897	0.0379	0.2209	0.2094	0.0609	0.1573
2883.06	2946.7	0.1695	0.0059	0.297	0.1471	0.0802	0.4169	0.4115	0.0986	0.2478
3014.19	3131.83	0.778	0.2907	0.8507	0.9108	0.1516	0.421	0.6364	0.5936	1.2564

Table S2. Grubb's statistic for every peak ratio for PEEK (cont.).

Peak limits / cm^{-1}		Peak ratio vs fresh sample								
From	To	Fresh	Oil A/168h	Oil A/672h	Oil B/168h	Oil B/672h	Oil C/168h	Oil C/672h	Oil D/168h	Oil D/672h
651.822	701.962	1	0.283	1.128	1.031	0.154	0.531	0.747	0.591	1.532
701.962	788.743	1	0.456	1.163	1.041	0.177	0.565	0.772	0.580	1.576
788.743	890.952	1	0.277	1.192	1.058	0.181	0.583	0.798	0.578	1.606
890.952	939.164	1	0.363	1.170	1.163	0.247	0.654	0.880	0.614	1.558
939.164	979.661	1	0.424	1.055	1.167	0.306	0.683	0.902	0.652	1.670
979.661	1020.16	1	0.376	1.168	1.209	0.240	0.631	0.865	0.637	1.615
1020.16	1122.37	1	0.344	1.082	1.044	0.179	0.501	0.706	0.591	1.644
1122.37	1166.72	1	0.235	1.357	1.124	0.155	0.580	0.787	0.490	1.818
1166.72	1197.58	1	0.245	1.339	1.121	0.174	0.590	0.823	0.483	1.832
1197.58	1263.15	1	0.223	1.344	1.020	0.156	0.616	0.800	0.505	1.514
1263.15	1290.14	1	0.345	1.141	1.172	0.255	0.648	0.892	0.619	1.624
1290.14	1340.28	1	0.349	1.061	1.075	0.255	0.604	0.840	0.637	1.450
1351.86	1430.92	1	0.395	1.079	1.135	0.291	0.683	0.934	0.680	1.467
1430.92	1521.56	1	0.335	1.137	1.119	0.239	0.624	0.874	0.628	1.609
1521.56	1625.7	1	0.351	1.080	1.114	0.256	0.614	0.879	0.646	1.595
1625.7	1689.34	1	0.325	1.113	1.027	0.230	0.617	0.861	0.634	1.331
2813.63	2883.06	1	0.145	1.794	0.979	0.414	2.412	2.286	0.665	1.717
2883.06	2946.7	1	0.035	1.752	0.868	0.473	2.460	2.428	0.582	1.462
3014.19	3131.83	1	0.374	1.093	1.171	0.195	0.541	0.818	0.763	1.615

Table S3. Grubb's statistic for every peak ratio for PEEK (cont.).

Peak limits / cm ⁻¹		G values for peak ratio								
From	To	Fresh	Oil A/168h	Oil A/672h	Oil B/168h	Oil B/672h	Oil C/168h	Oil C/672h	Oil D/168h	Oil D/672h
651.822	701.962	N.A.	0.26	0.45	0.67	1.02	0.46	0.51	0.27	0.49
701.962	788.743	N.A.	1.46	0.28	0.54	0.75	0.40	0.46	0.44	0.13
788.743	890.952	N.A.	0.33	0.15	0.34	0.70	0.37	0.41	0.47	0.12
890.952	939.164	N.A.	0.54	0.25	0.93	0.07	0.25	0.24	0.07	0.27
939.164	979.661	N.A.	1.14	0.79	0.97	0.76	0.20	0.19	0.63	0.64
979.661	1020.16	N.A.	0.67	0.26	1.48	0.00	0.29	0.27	0.42	0.20
1020.16	1122.37	N.A.	0.34	0.66	0.51	0.73	0.51	0.60	0.27	0.43
1122.37	1166.72	N.A.	0.74	0.62	0.46	1.00	0.37	0.43	1.76	1.86
1166.72	1197.58	N.A.	0.64	0.54	0.42	0.78	0.36	0.35	1.87	1.98
1197.58	1263.15	N.A.	0.86	0.56	0.80	0.99	0.31	0.40	1.55	0.64
1263.15	1290.14	N.A.	0.35	0.38	1.03	0.17	0.26	0.21	0.14	0.27
1290.14	1340.28	N.A.	0.39	0.76	0.14	0.16	0.33	0.32	0.42	1.16
1351.86	1430.92	N.A.	0.86	0.68	0.59	0.59	0.20	0.12	1.05	1.02
1430.92	1521.56	N.A.	0.25	0.40	0.40	0.03	0.30	0.25	0.29	0.14
1521.56	1625.7	N.A.	0.41	0.67	0.33	0.18	0.31	0.24	0.54	0.03
1625.7	1689.34	N.A.	0.16	0.51	0.72	0.13	0.31	0.27	0.37	2.14
2813.63	2883.06	N.A.	1.64	2.65	1.29	2.02	2.79	2.67	0.83	1.03
2883.06	2946.7	N.A.	2.74	2.46	2.63	2.71	2.87	2.96	0.41	1.06
3014.19	3131.83	N.A.	0.64	0.61	1.02	0.54	0.44	0.36	2.28	0.19

Critic G value (P=0.05, n=19) = 2.68

Table S4. Grubb's statistic for every peak ratio for PTFE.

Peak limits / cm ⁻¹		Peak area								
From	To	Fresh	Oil A/168h	Oil A/672h	Oil B/168h	Oil B/672h	Oil C/168h	Oil C/672h	Oil D/168h	Oil D/672h
599.753	680.749	6.3302	7.0543	5.5796	7.499	7.4539	7.7482	7.7541	7.3355	7.1243
1024.02	1176.37	15.1408	25.9552	12.4736	32.1433	27.9094	27.8658	26.2215	23.6678	20.723
1176.37	1270.86	11.8999	16.2183	10.5243	17.5698	16.5984	17.3706	16.7992	15.8825	15.1859
2154.1	25424.36	2.5929	2.2086	1.5066	2.3531	2.4177	2.2636	2.5407	2.4019	2.1923
2775.06	2879.2	0.0265	0.0131	0.0136	0.0192	0.0042	0.0092	0.0151	0.0176	0.1649
2879.2	2944.77	0.0916	0.0504	0.0476	0.0704	0.019	0.033	0.0639	0.06	0.5318
2944.77	3014.19	-0.0295	-0.0075	-0.0128	-0.0118	-0.0139	-0.012	-0.0186	-0.0211	-0.0714

Peak limits / cm ⁻¹		Peak ratio vs fresh sample								
From	To	Fresh	Oil A/168h	Oil A/672h	Oil B/168h	Oil B/672h	Oil C/168h	Oil C/672h	Oil D/168h	Oil D/672h
599.753	680.749	1	1.114	0.881	1.185	1.178	1.224	1.225	1.159	1.125
1024.02	1176.37	1	1.714	0.824	2.123	1.843	1.840	1.732	1.563	1.369
1176.37	1270.86	1	1.363	0.884	1.476	1.395	1.460	1.412	1.335	1.276
2154.1	25424.36	1	0.852	0.581	0.908	0.932	0.873	0.980	0.926	0.846
2775.06	2879.2	1	0.494	0.513	0.725	0.158	0.347	0.570	0.664	6.223
2879.2	2944.77	1	0.550	0.520	0.769	0.207	0.360	0.698	0.655	5.806
2944.77	3014.19	1	0.254	0.434	0.400	0.471	0.407	0.631	0.715	2.420

Peak limits / cm ⁻¹		G values for peak ratio								
From	To	Fresh	Oil A/168h	Oil A/672h	Oil B/168h	Oil B/672h	Oil C/168h	Oil C/672h	Oil D/168h	Oil D/672h
599.753	680.749	N.A.	0.40	1.13	0.18	0.46	0.49	0.43	0.44	0.69
1024.02	1176.37	N.A.	1.55	0.83	1.81	1.51	1.53	1.58	1.56	0.59
1176.37	1270.86	N.A.	0.88	1.15	0.69	0.80	0.89	0.86	0.93	0.63

2154.1	25424.36	N.A.	0.10	0.42	0.31	0.08	0.10	0.13	0.21	0.82
2775.06	2879.2	N.A.	0.79	0.77	0.63	1.14	0.98	1.06	0.94	1.52
2879.2	2944.77	N.A.	0.68	0.74	0.55	1.06	0.95	0.77	0.97	1.34
2944.77	3014.19	N.A.	1.25	1.18	1.19	0.65	0.88	0.92	0.80	0.13

Critic G value (P=0.05. n=7) = 2,02

Table SI-5 Grubb's statistic for every peak ratio for PA 66.

Peak limits / cm ⁻¹		Peak area								
From	To	Fresh	Oil A/168h	Oil A/672h	Oil B/168h	Oil B/672h	Oil C/168h	Oil C/672h	Oil D/168h	Oil D/672h
2763.49	2886.92	0.4039	1.7473	0.115	0.9902	1.1723	0.9782	0.3522	1.0264	0.815
2886.92	2989.12	1.6753	7.3403	0.6729	4.3936	5.3291	6.0282	2.0204	6.3634	3.4839
3012.27	3131.83	0.589	1.7547	0.1387	1.3694	1.2937	1.4263	0.5007	1.3905	1.096
3139.54	3396.03	4.4043	16.5608	1.2297	11.2557	12.0798	11.891	4.2608	12.163	9.0534

Peak limits / cm ⁻¹		Peak ratio vs fresh sample								
From	To	Fresh	Oil A/168h	Oil A/672h	Oil B/168h	Oil B/672h	Oil C/168h	Oil C/672h	Oil D/168h	Oil D/672h
2763.49	2886.92	1	4.326	0.285	2.452	2.902	2.422	0.872	2.541	2.018
2886.92	2989.12	1	4.381	0.402	2.623	3.181	3.598	1.206	3.798	2.080
3012.27	3131.83	1	2.979	0.235	2.325	2.196	2.422	0.850	2.361	1.861
3139.54	3396.03	1	3.760	0.279	2.556	2.743	2.700	0.967	2.762	2.056

Peak limits / cm ⁻¹		G values for peak ratio								
From	To	Fresh	Oil A/168h	Oil A/672h	Oil B/168h	Oil B/672h	Oil C/168h	Oil C/672h	Oil D/168h	Oil D/672h
2763.49	2886.92	N.A.	0.71	0.22	0.29	0.35	0.65	0.63	0.50	0.15
2886.92	2989.12	N.A.	0.80	1.43	1.03	1.03	1.46	1.42	1.45	0.77
3012.27	3131.83	N.A.	1.35	0.91	1.26	1.35	0.65	0.76	0.78	1.45
3139.54	3396.03	N.A.	0.16	0.30	0.52	0.03	0.15	0.04	0.16	0.53

Critic G value (P=0.05. n=4) = 1.48