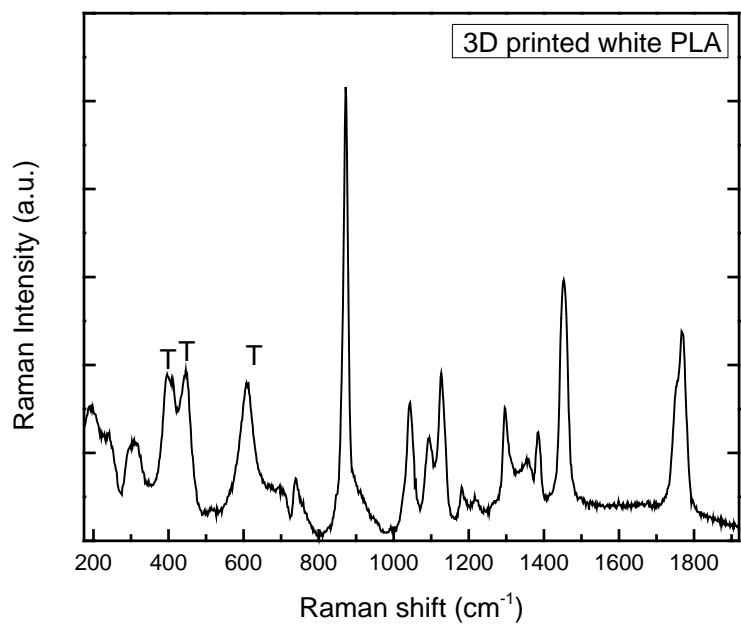
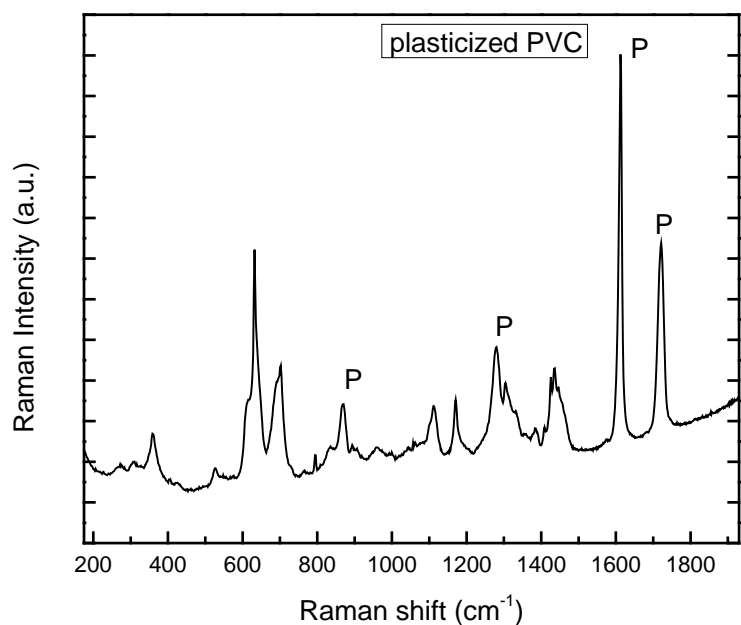


## SUPPLEMENTARY MATERIAL



**Figure S1.** Raman spectrum of the commercial 3d printed PLA. T stands for Titanium dioxide peaks.  
(Reference used for identification: Yanming Cai, Jungang Lv and Jimin Feng, *Journal of Polymers and the Environment*, 2013, 21:108-114. & U. Balachandran, N.G. Eror, *Journal of Solid State Chemistry*, 1982, 42:276-282.)



**Figure S2.** Raman spectrum of commercial plasticized PVC. P stands for the peaks of di-octyl terephthalate plasticizer (DOTP)

[Reference used for identification: S. De Groot and the Cultural Heritage Agency of the Netherlands: RSR00005, Polyvinyl chloride plasticized, Ed. Beth A. Price, Boris Pretzel and Suzanne Quillen Lomax. Infrared and Raman Users Group Spectral Database. Infrared and Raman Users Group, 2007. Web.

[www.irug.org](http://www.irug.org) (accessed on 13.07.21) & [www.sigmaaldrich.com](http://www.sigmaaldrich.com). Available online:

<https://www.sigmaaldrich.com/deepweb/assets/sigmaaldrich/quality/spectra/396/367/RAIR010011.pdf> (accessed on 13.07.21)]

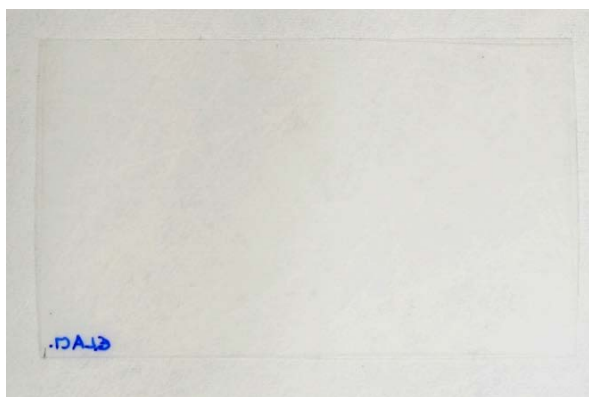
(a)



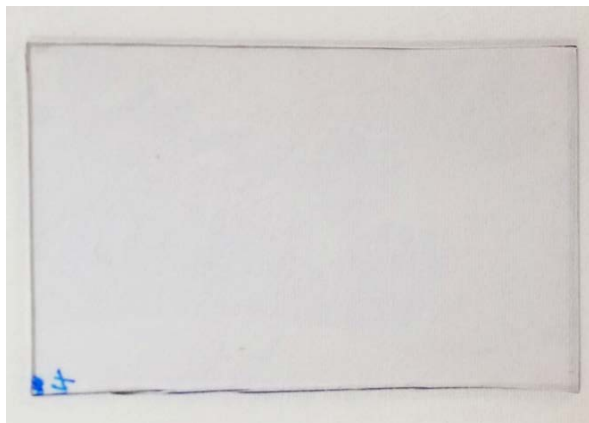
(b)



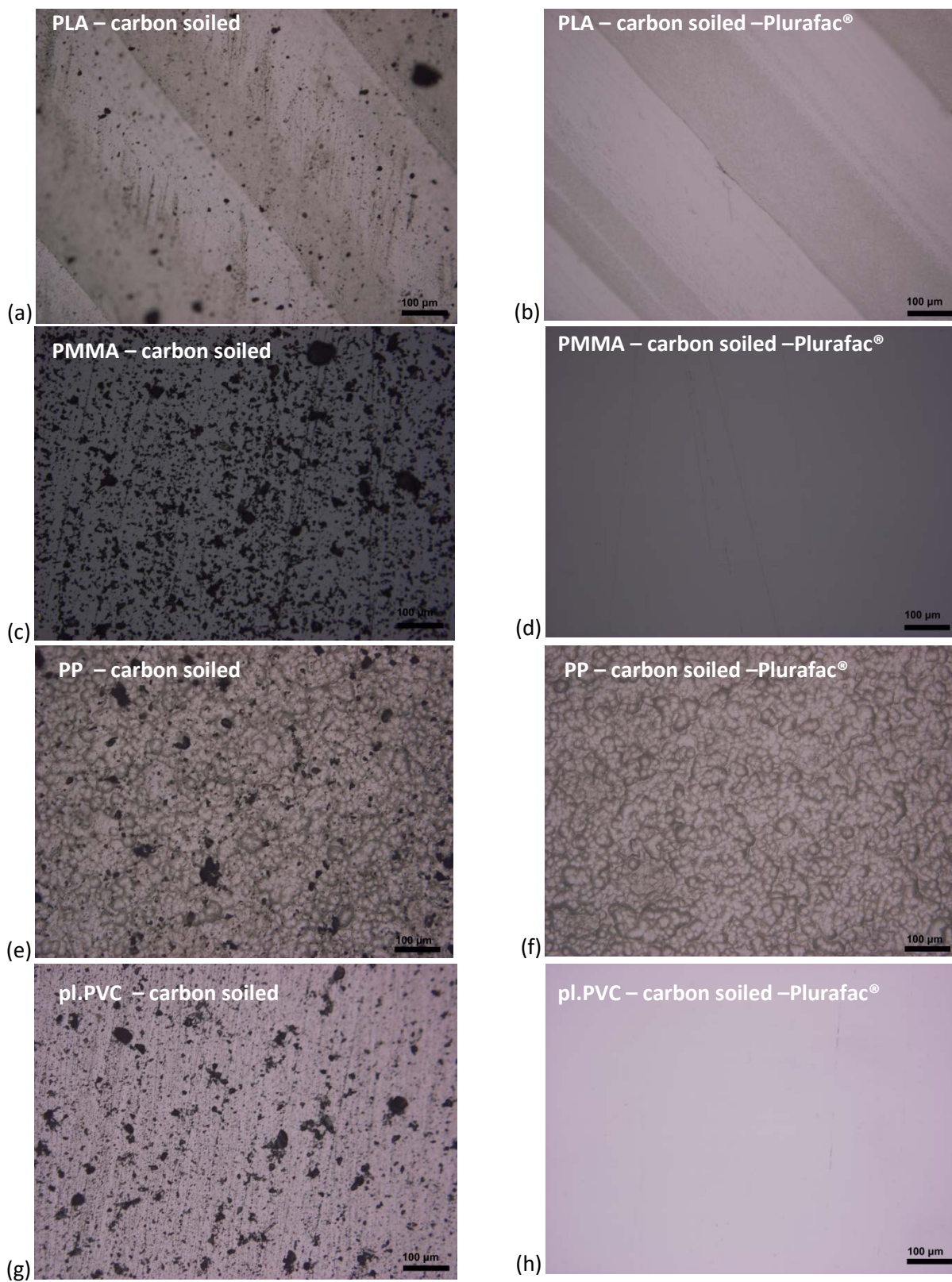
(c)



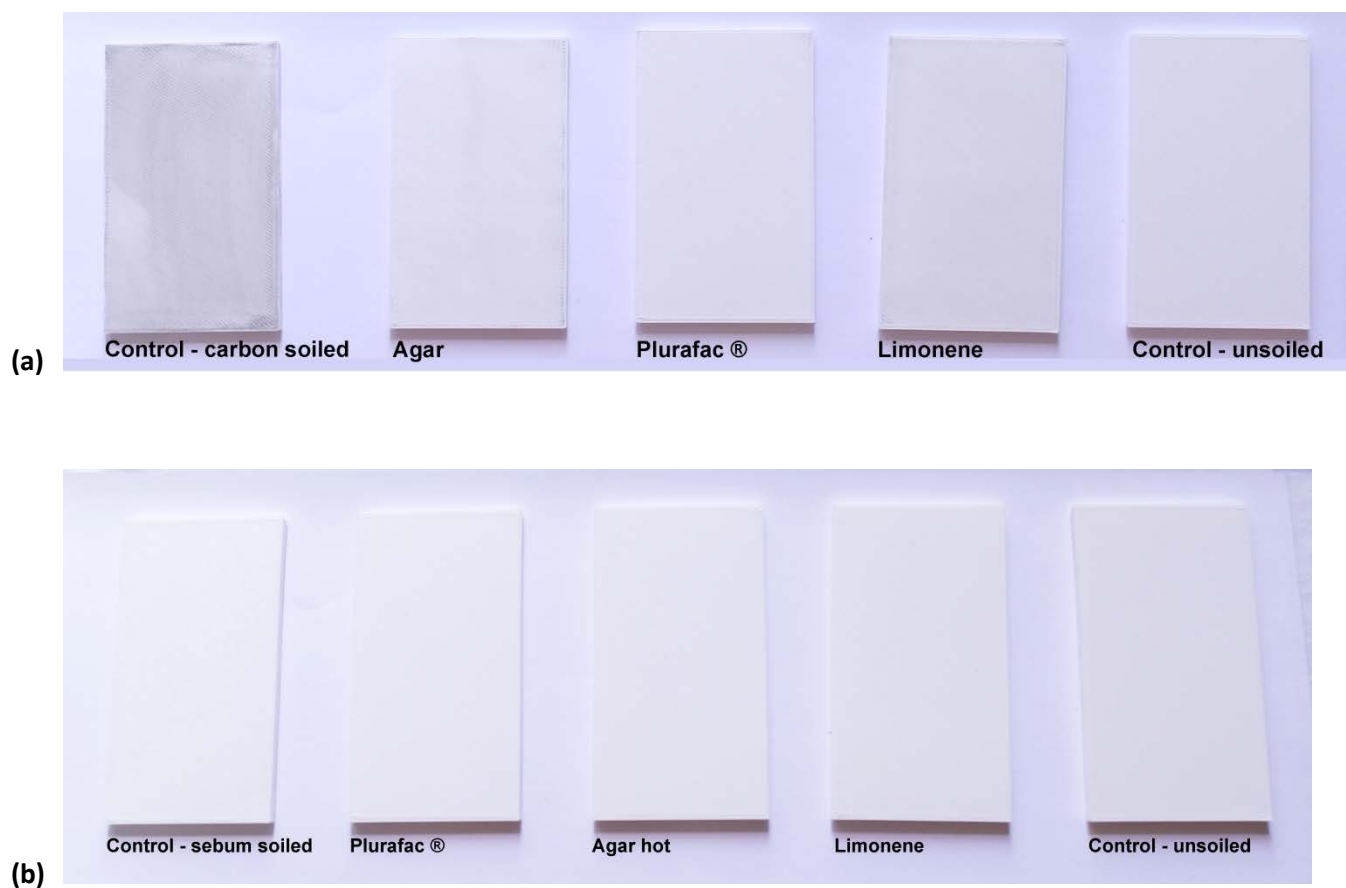
(d)



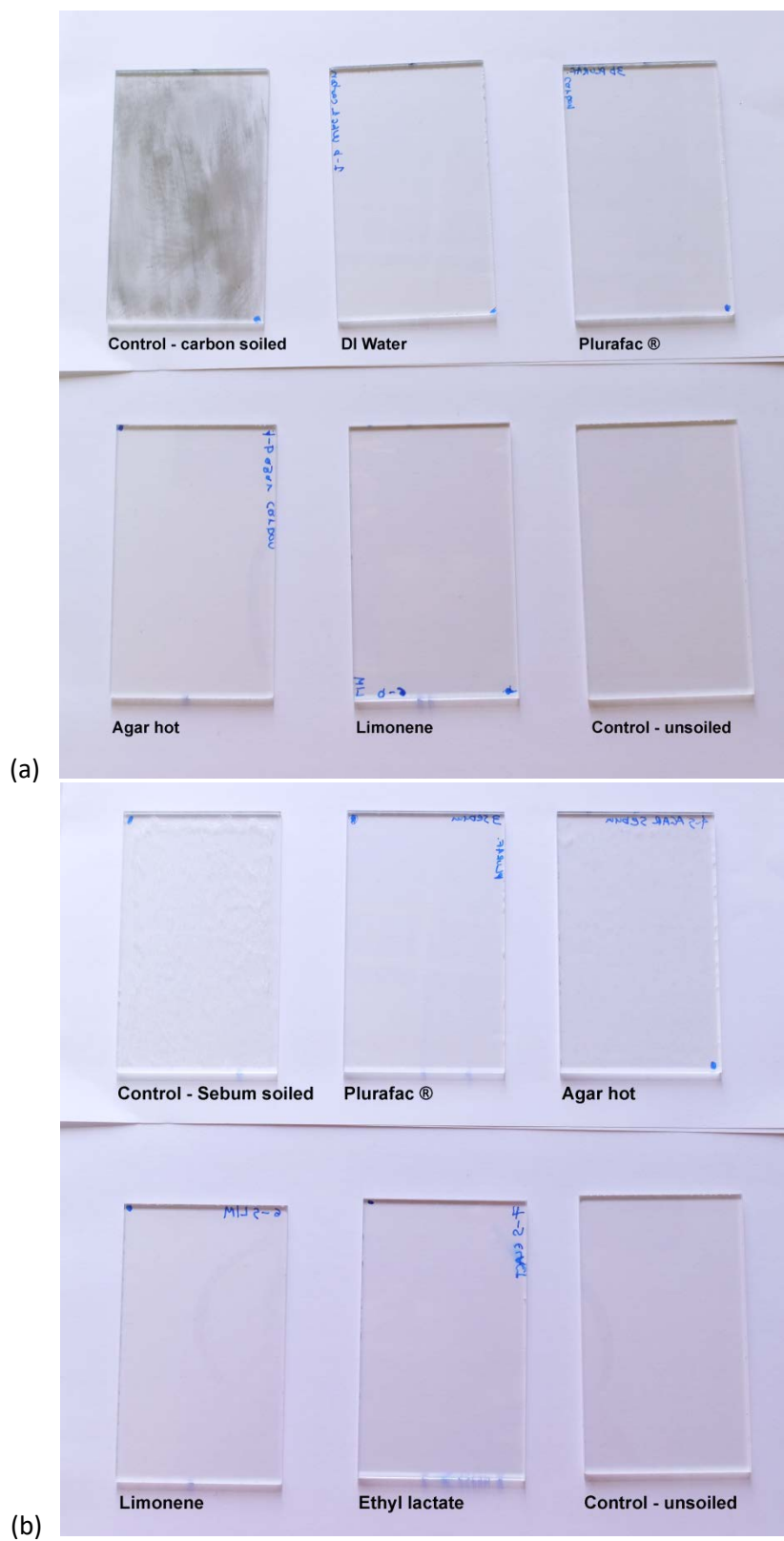
**Figure S3.** Control samples of a) PLA, b) PMMA, c) PP and d) PVC.



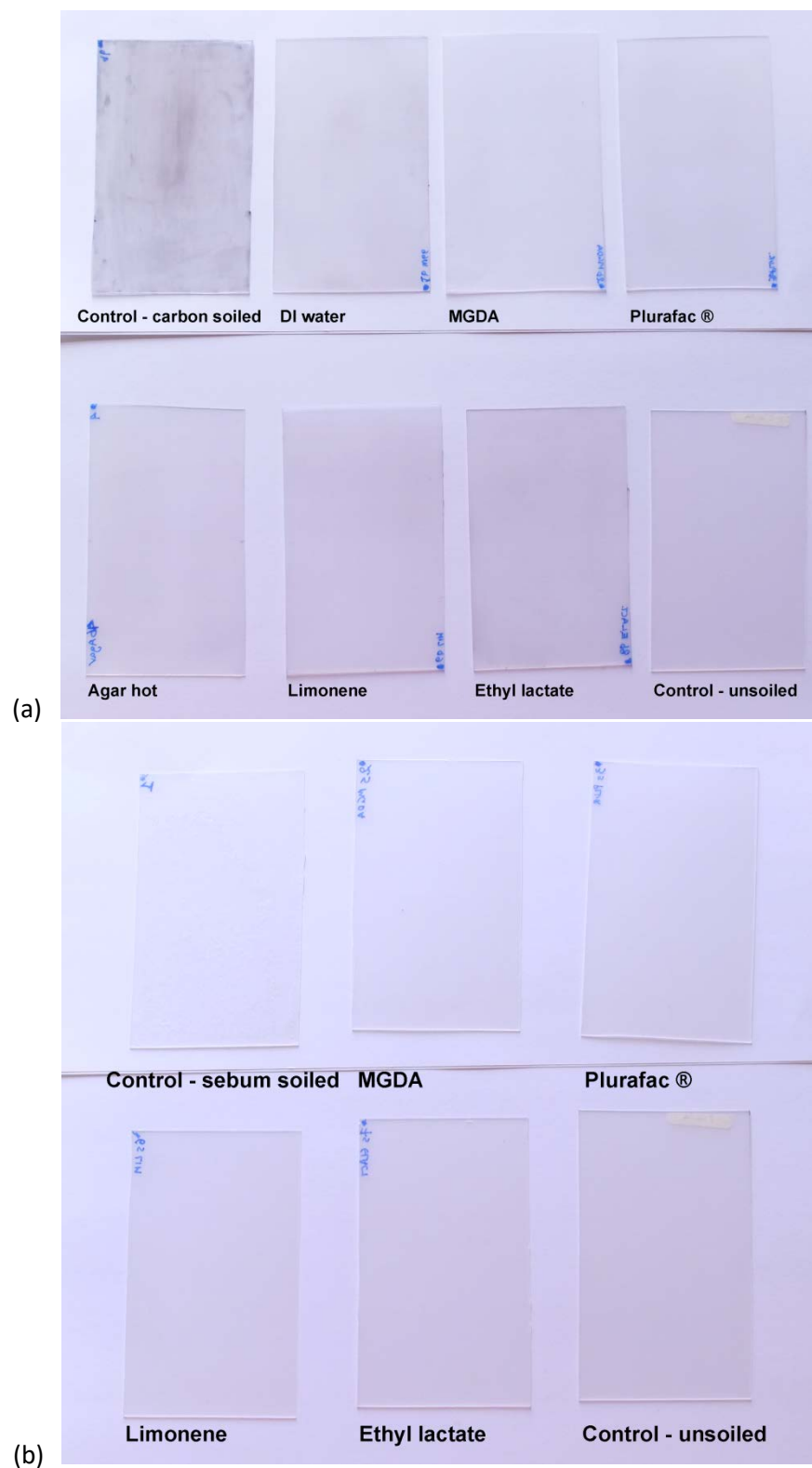
**Figure S4.** OM images of PLA, PMMA, PP and pl.PVC carbon soiled samples before (a,c,e,g) and after (b,d,f,h) the cleaning with Plurafac® LF900 solution.



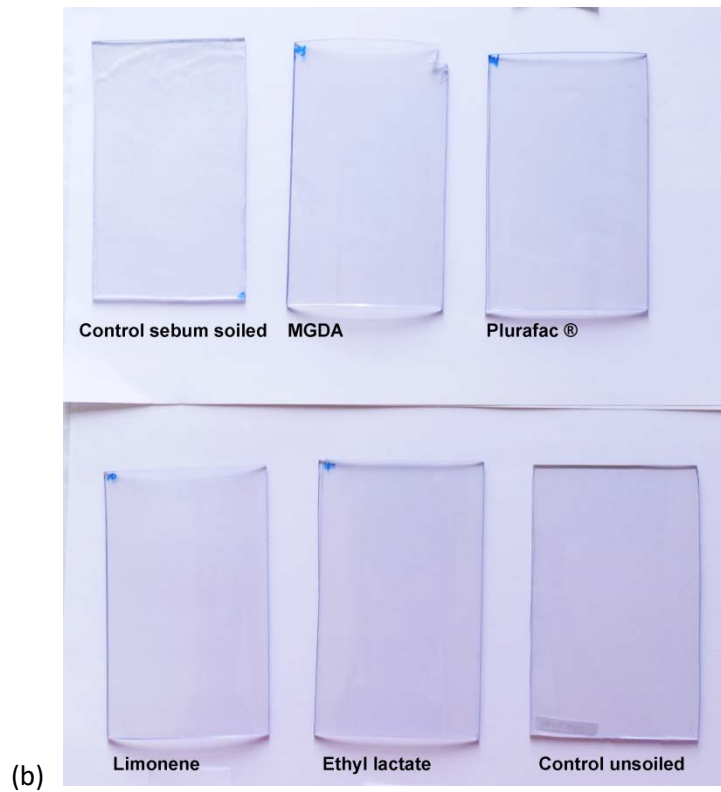
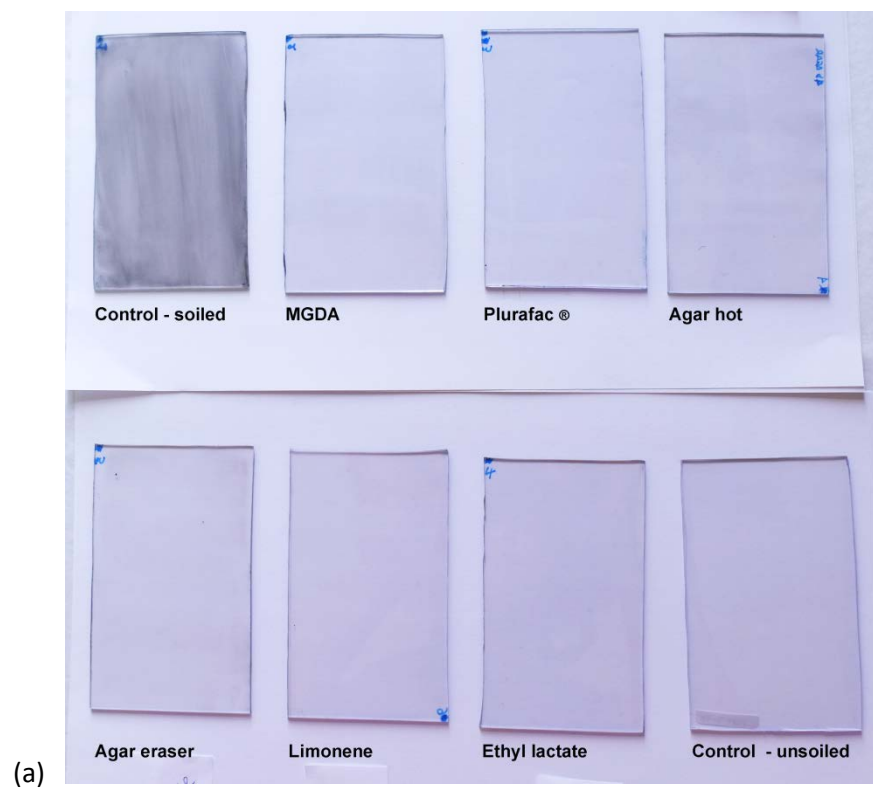
**Figure S5.** Photographs of soiled and cleaned PLA samples a) carbon soiled, b) sebum soiled.



**Figure S6.** Photographs of soiled and cleaned PMMA samples a) carbon soiled, b) sebum soiled.

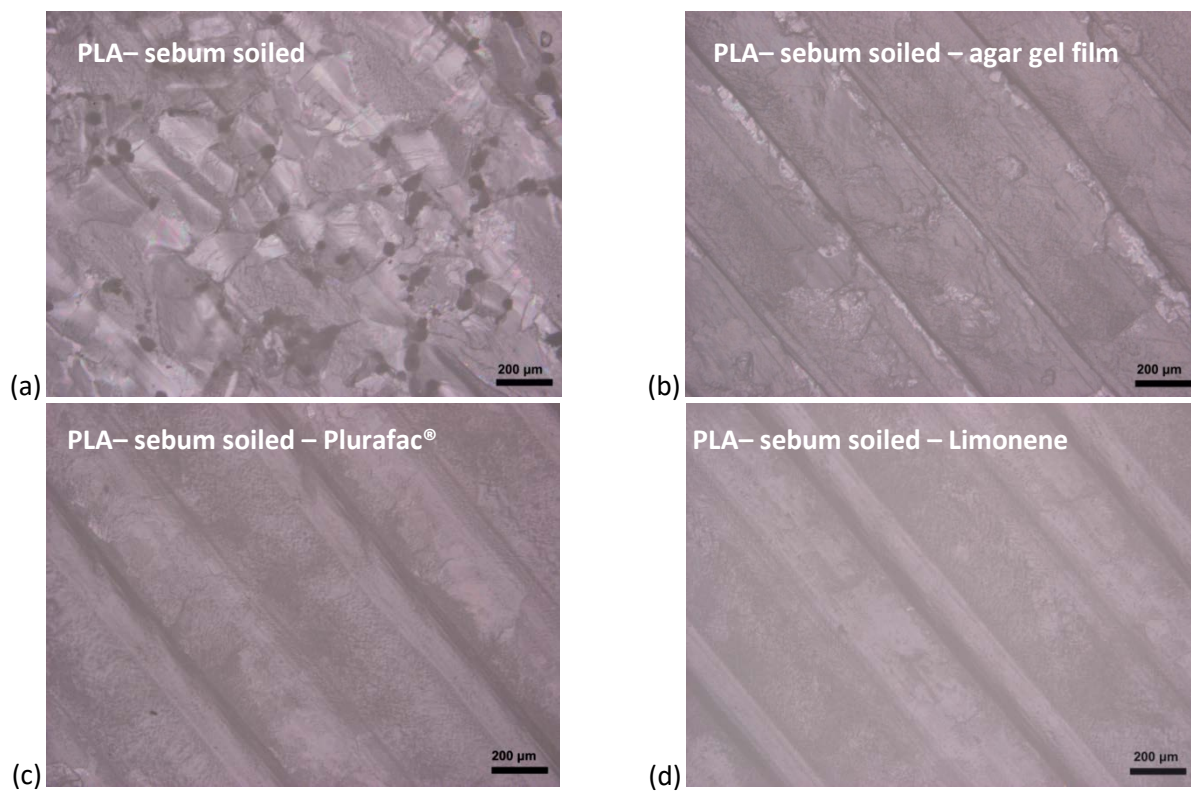


**Figure S7.** Photographs of soiled and cleaned PP samples a) carbon soiled, b) sebum soiled.

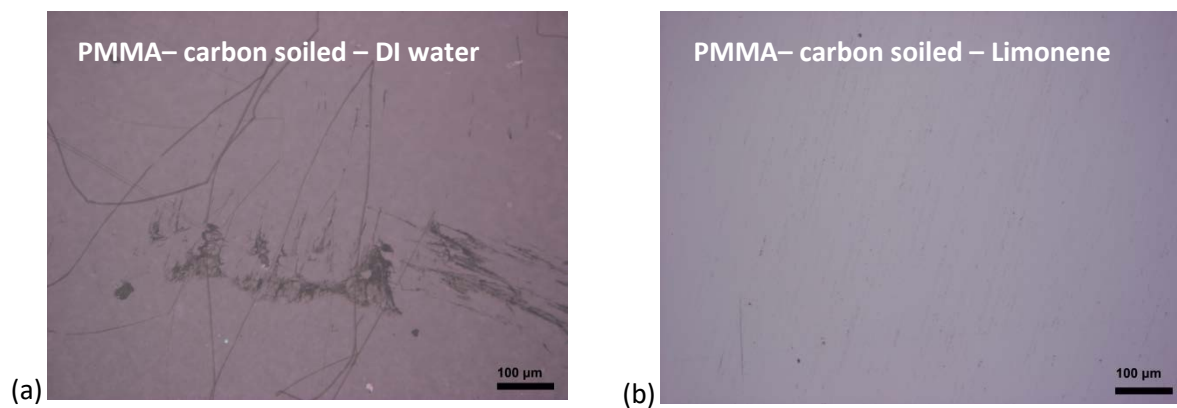


**Figure S8.** Photographs of soiled and cleaned pl. PVC samples a) carbon soiled, b) sebum soiled.

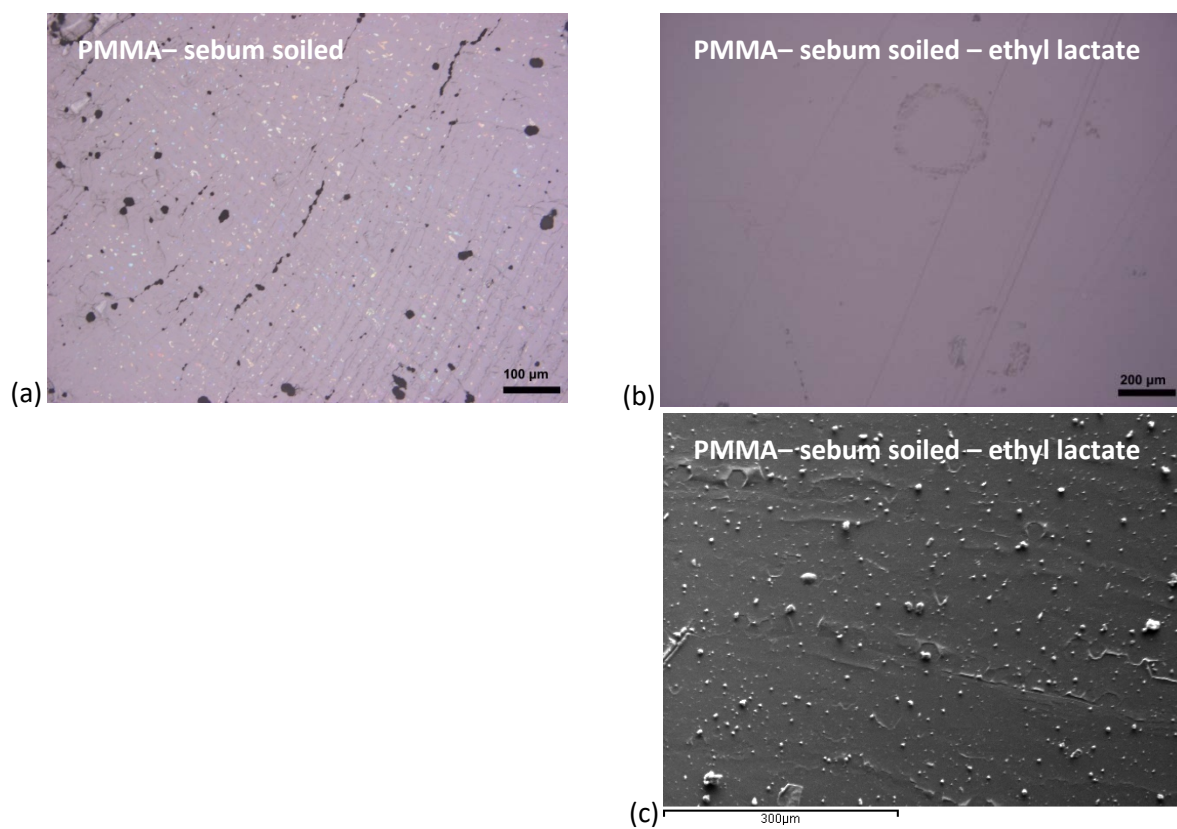




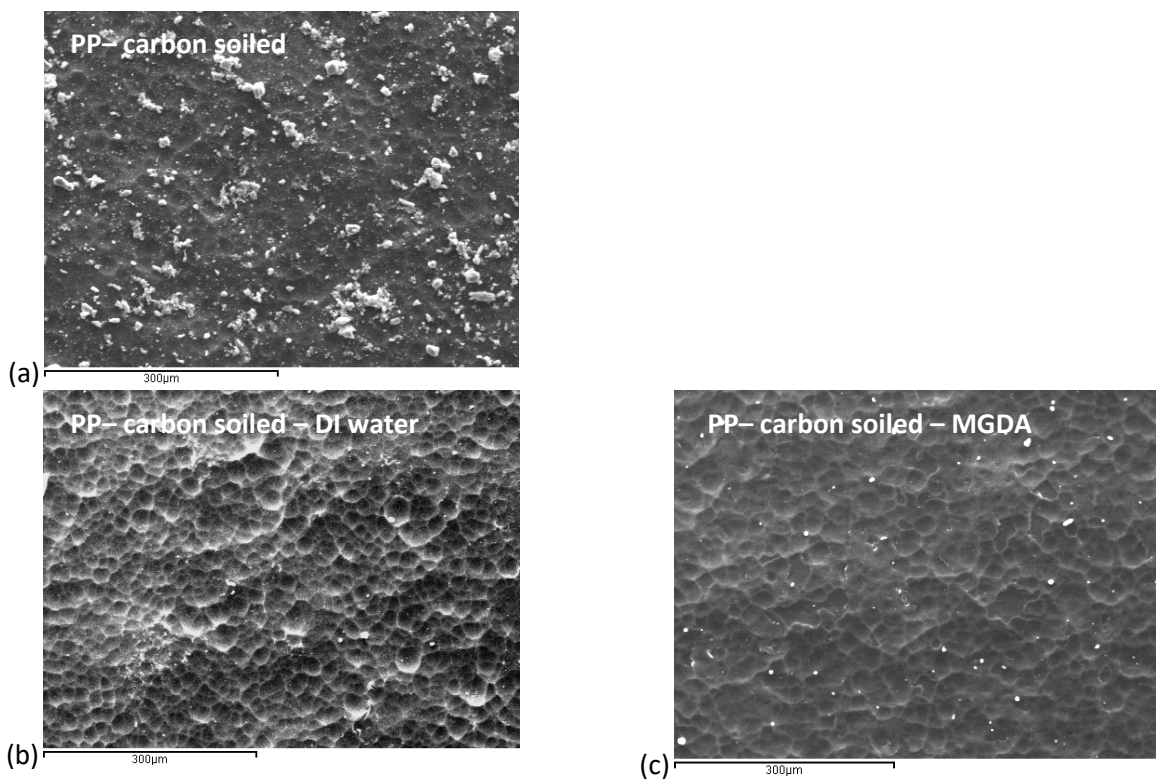
**Figure S9.** OM images of sebum soiled PLA, a) control, and after cleaning with b) agar gel film, c) Plurafac® solution and d) limonene.



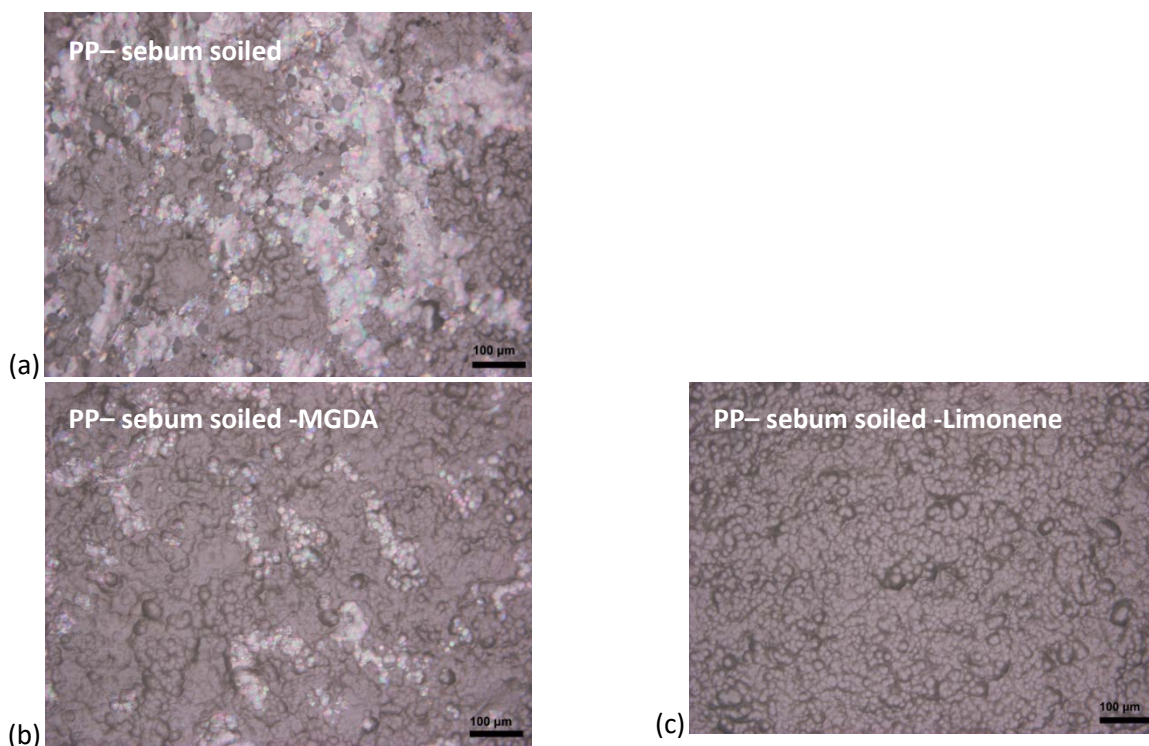
**Figure S10.** OM images of carbon soiled PMMA, cleaned with a) DI water and b) limonene.



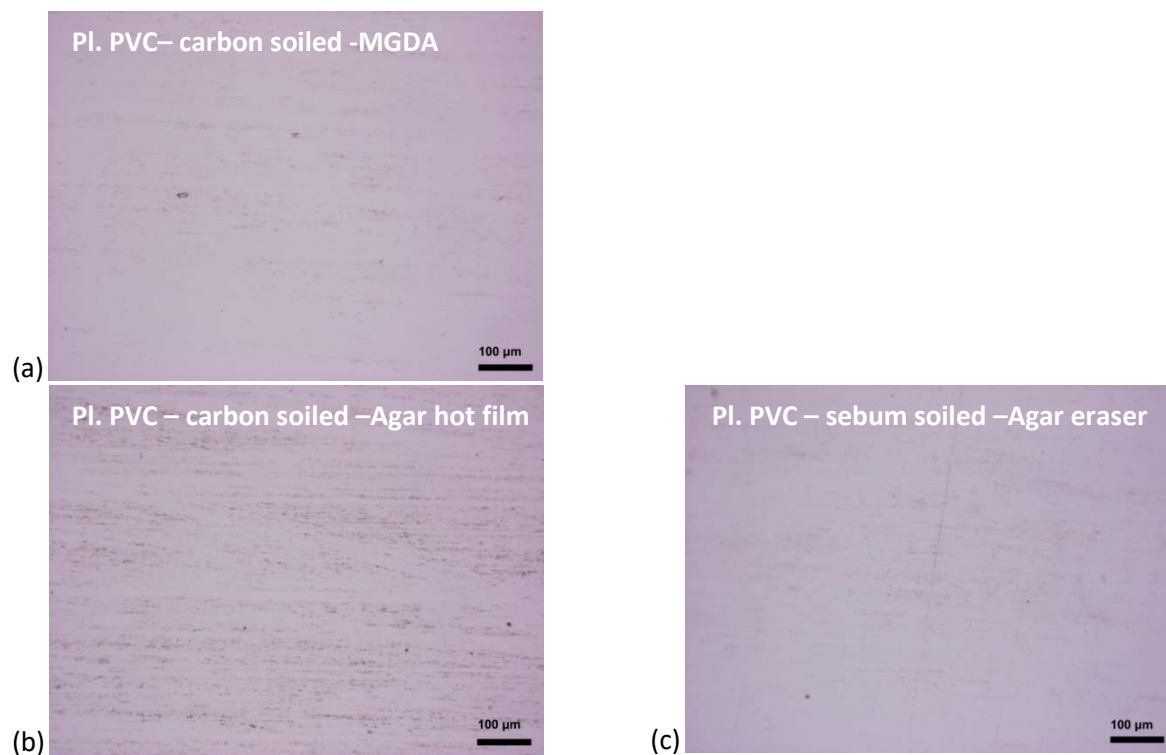
**Figure S11.** OM images of sebum soiled PMMA, a) control and b) after cleaning with ethyl lactate and c) SEM image after cleaning with ethyl lactate.



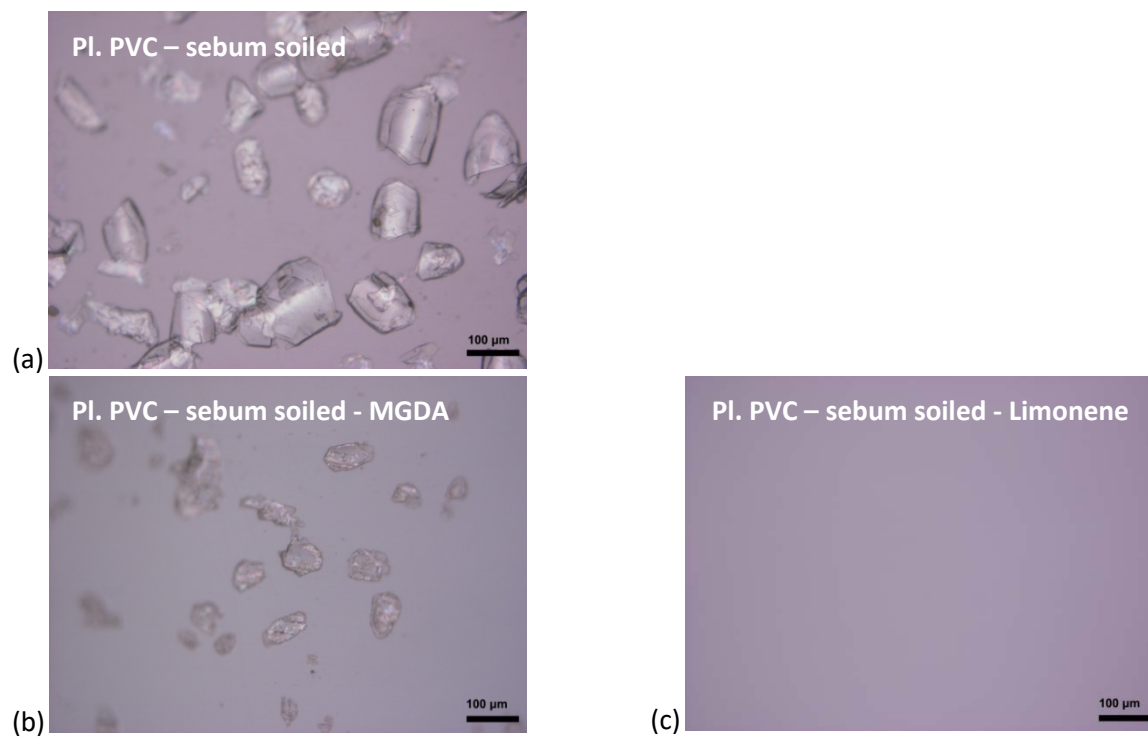
**Figure S12.** SEM images of carbon soiled PP, a) control and after cleaning with b) DI water and c) MGDA chelate solution.



**Figure S13.** OM images of sebum soiled PP a) control and after cleaning with b) MGDA chelate solution and c) limonene.



**Figure S14.** OM images of carbon soiled pl. PVC, cleaned with a) MGDA chelate solution, b) hot agar film and c) agar in the form of eraser.



**Figure S15.** OM images of sebum soiled pl. PVC, a) control, and after cleaning with b) MGDA chelate solution and c) limonene.

**Table S1.** Details of the cleaning procedure followed for the artificially soiled samples. CS: carbon soiled; SS: sebum soiled; CL: cleaning; WCL: wet clearance; DCL: dry clearance

[illegible]

**Table S2.** List of the Hansen solubility parameters of the selected compounds. The solubility distance (Ra) between compounds can be calculated by the equation.

$$Ra = \sqrt{4(\delta_{d2} - \delta_{d1})^2 + (\delta_{p2} - \delta_{p1})^2 + (\delta_{h2} - \delta_{h1})^2}$$

	$\delta_d$	$\delta_p$	$\delta_h$
PVC	17.6	7.8	3.4
DOTP	16.6	7	3.1
Limonene	17.2	1.8	4.3
Ethyl lactate	16	7.6	12.5
Palmitic acid	16.3	3.4	6

**Table S3.** Ra values between the selected compounds.

	Ra		
	Limonene	Ethyl lactate	Palmitic acid
PVC	6.12	9.65	5.73
DOTP	5.47	9.50	4.66