



FTIR-Imaging in der Analyse von Mikroplastik im Boden

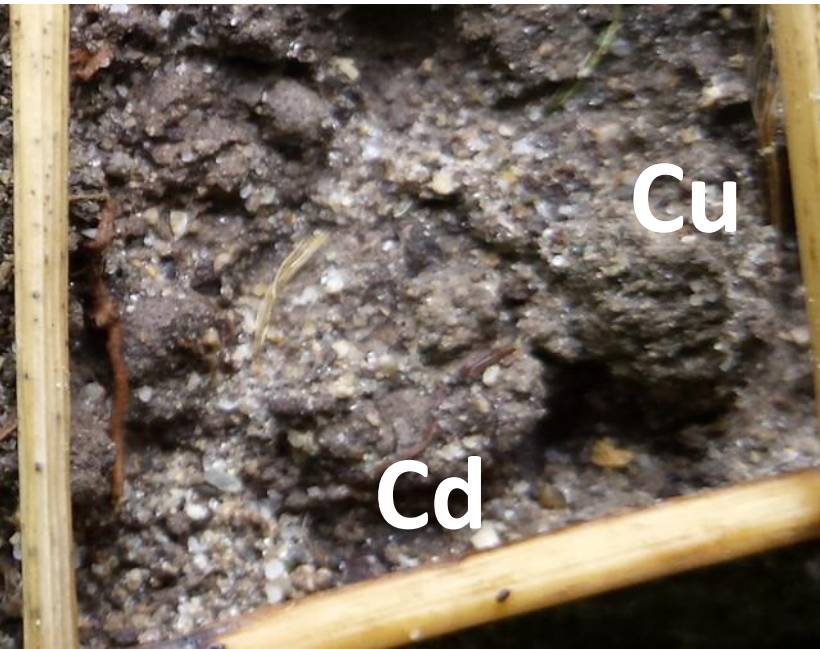


Prof. Dr. Moritz Bigalke



Institut für Angewandte Geowissenschaften

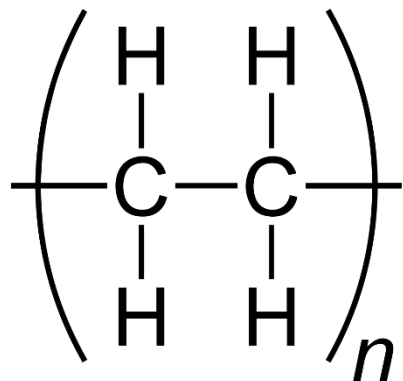
Fachgebiet: Bodenmineralogie und Bodenchemie



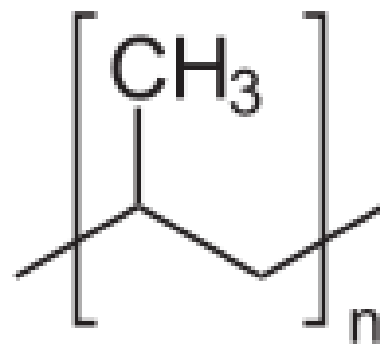
Einleitung



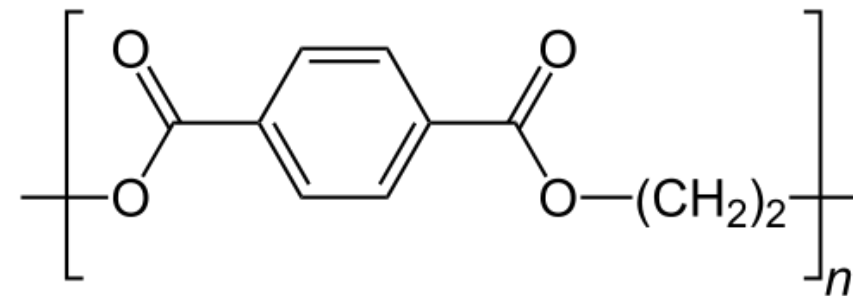
Einleitung



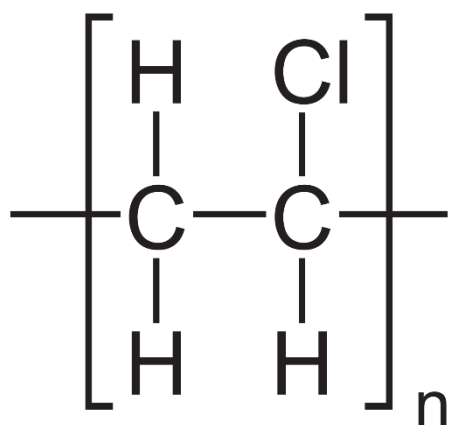
(PE)



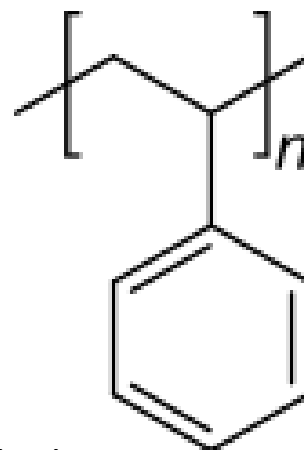
(PP)



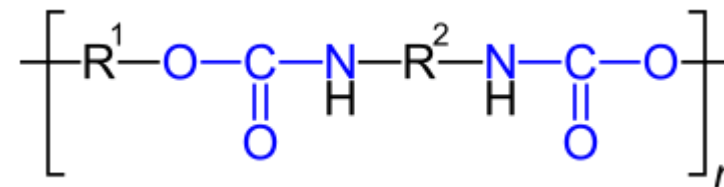
(PET)



(PVC)

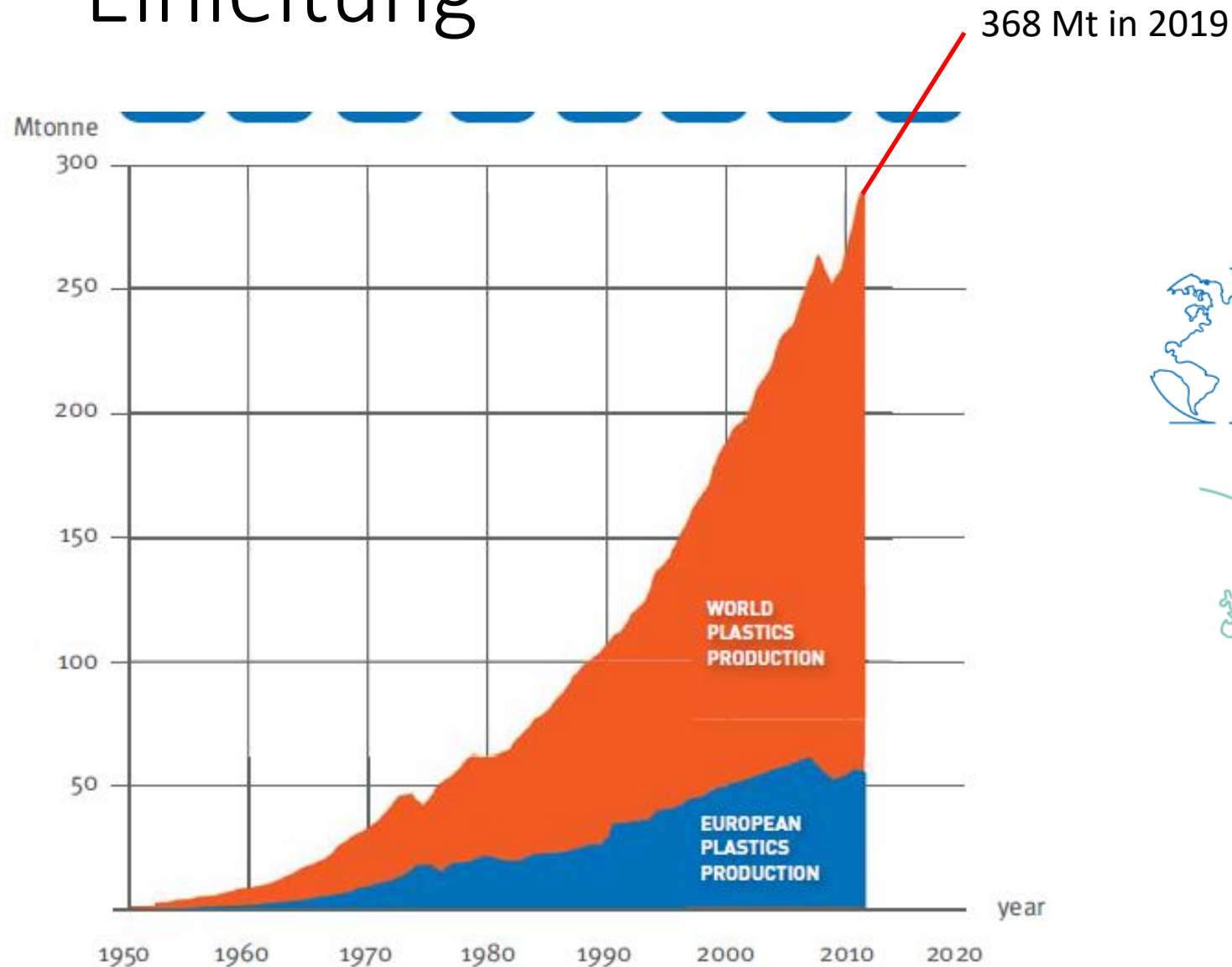


(PS)



(PUR)

Einleitung



World

2018 2019
359 → **368**
million tonnes million tonnes



Europe
(EU28+NO/CH)

2018 2019
61.8 → **57.9**
million tonnes million tonnes

(Plastics Europe 2013)

(Plastics Europe 2020)



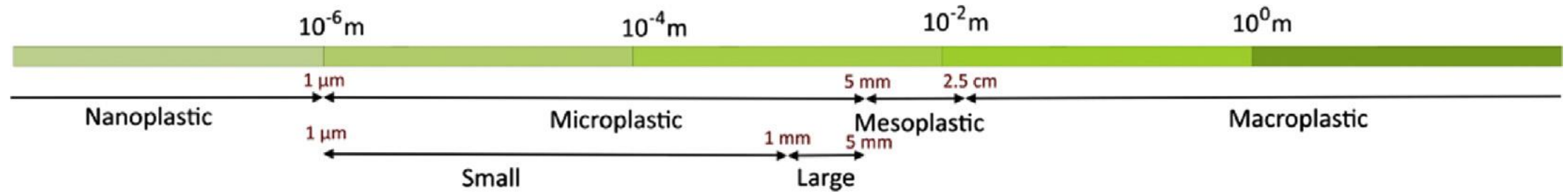
Einleitung



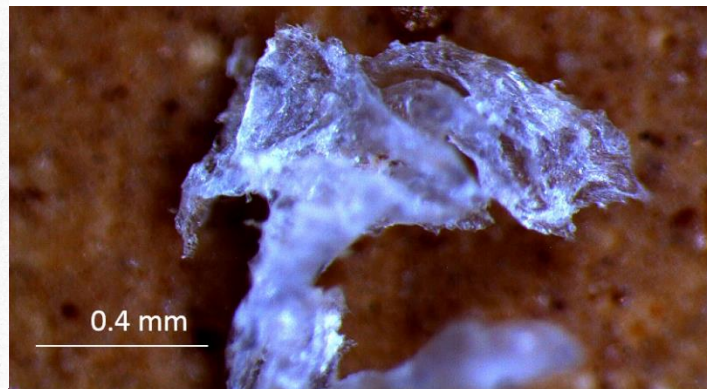
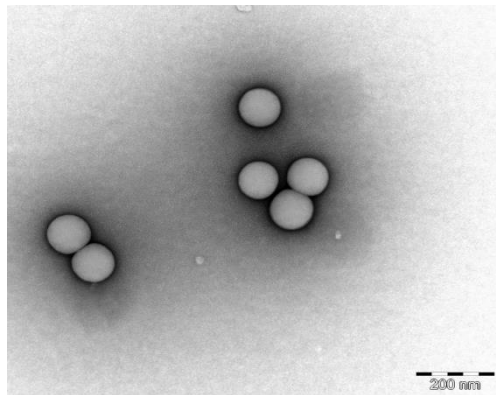
Einleitung



Einleitung



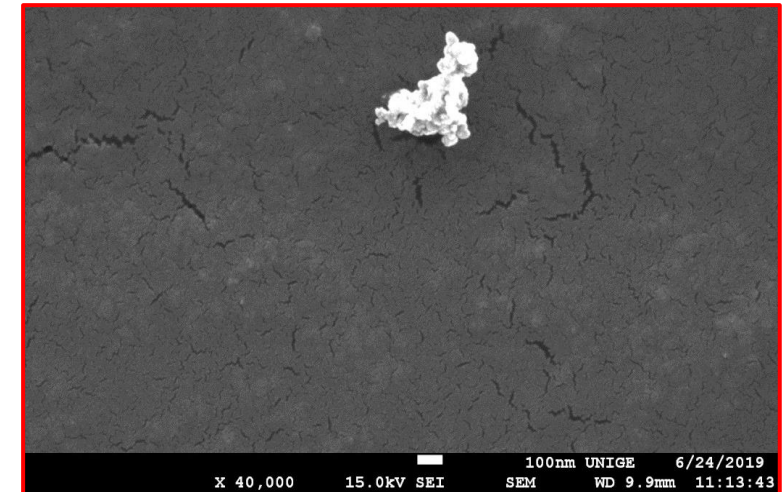
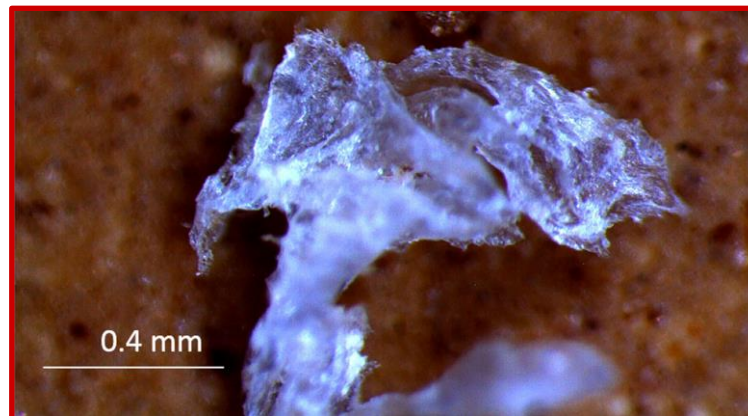
(Van Cauwenberge 2015)



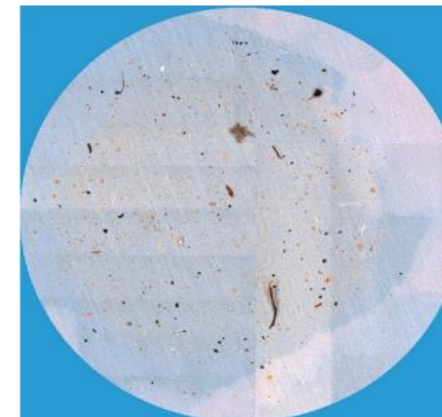
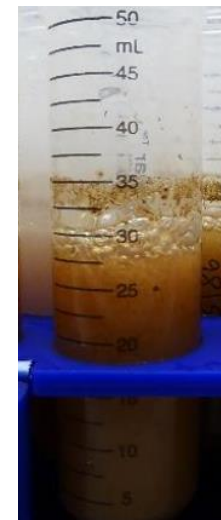
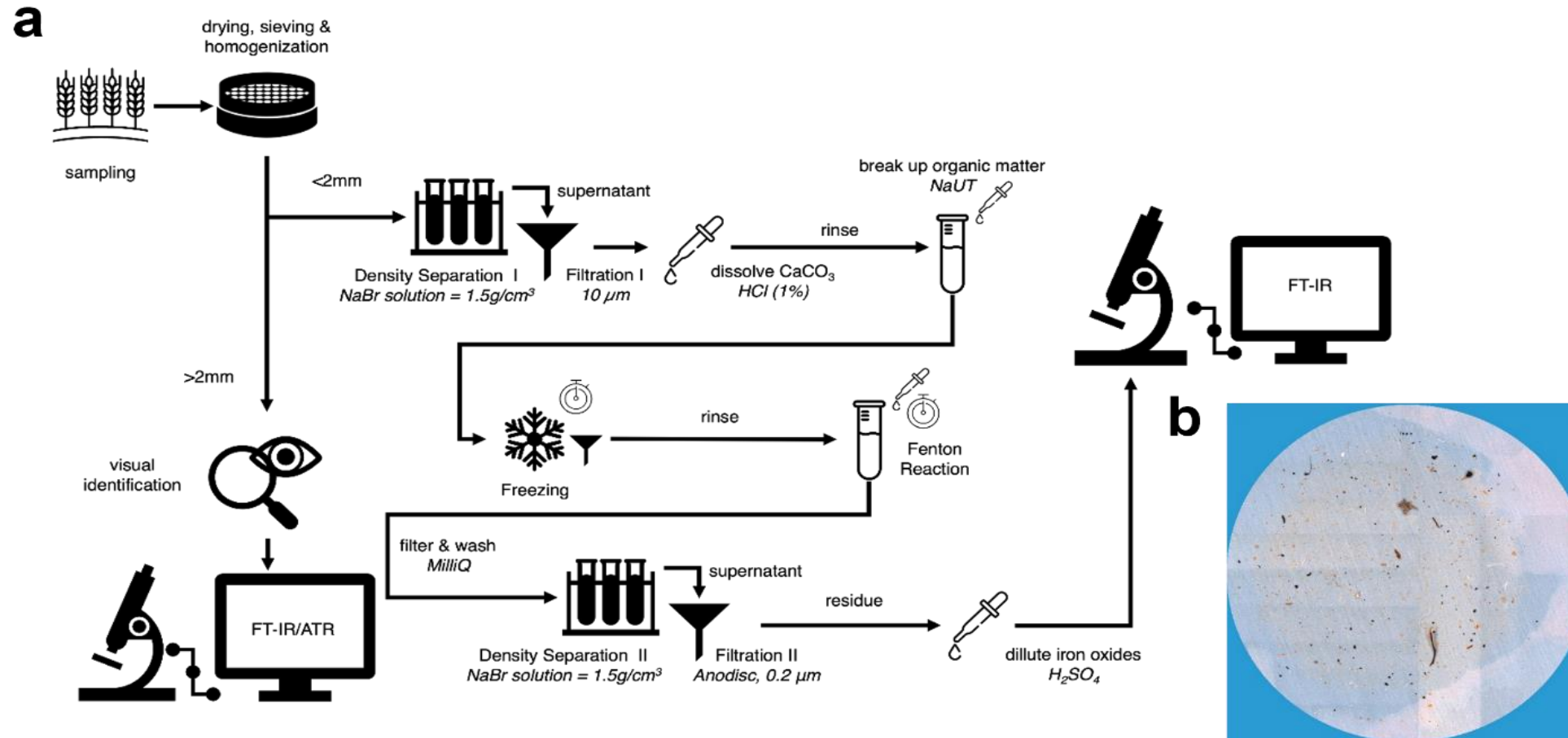
Einleitung



Analyse von Mikroplastik im Boden



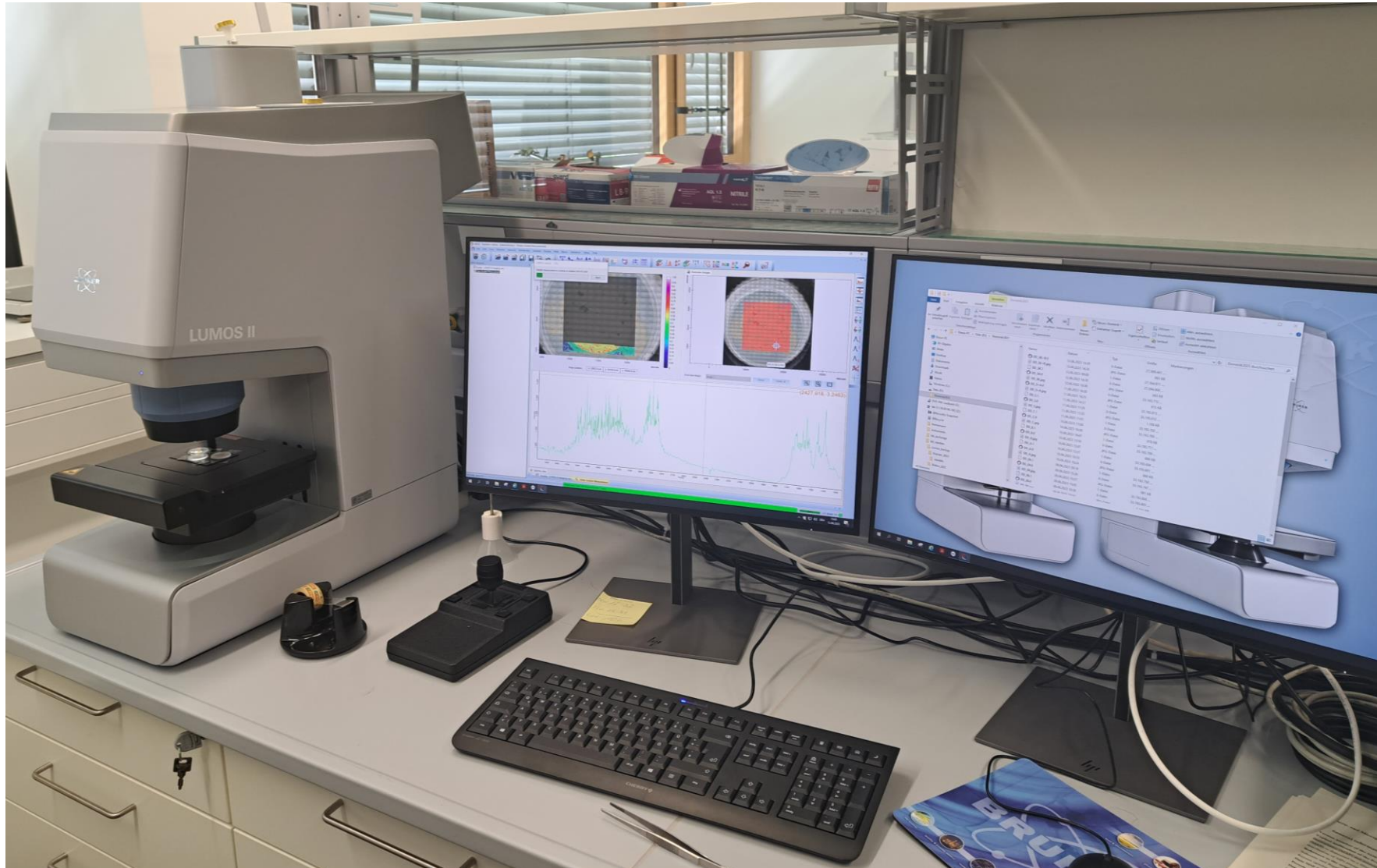
Analyse von Mikroplastik im Boden



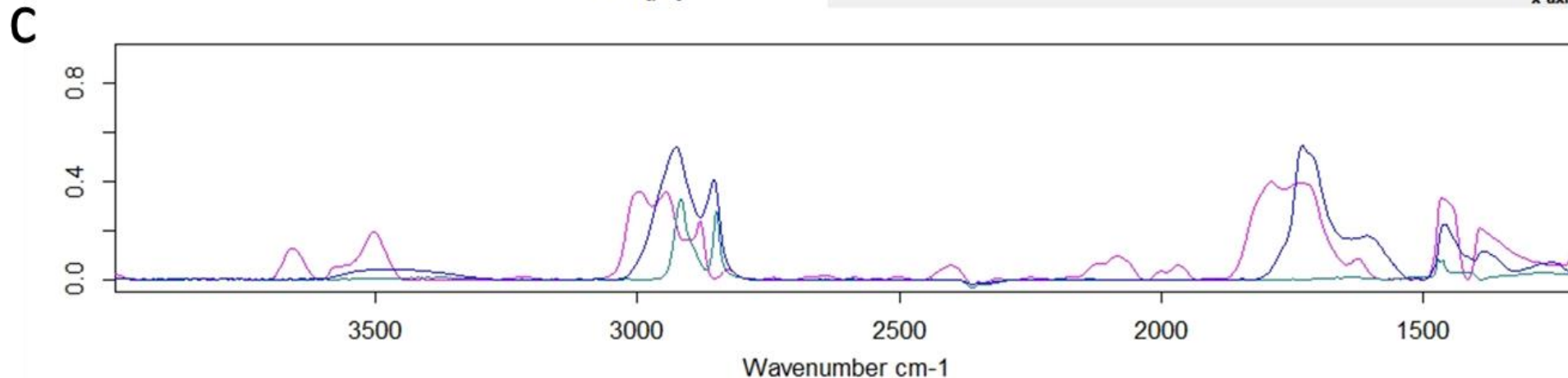
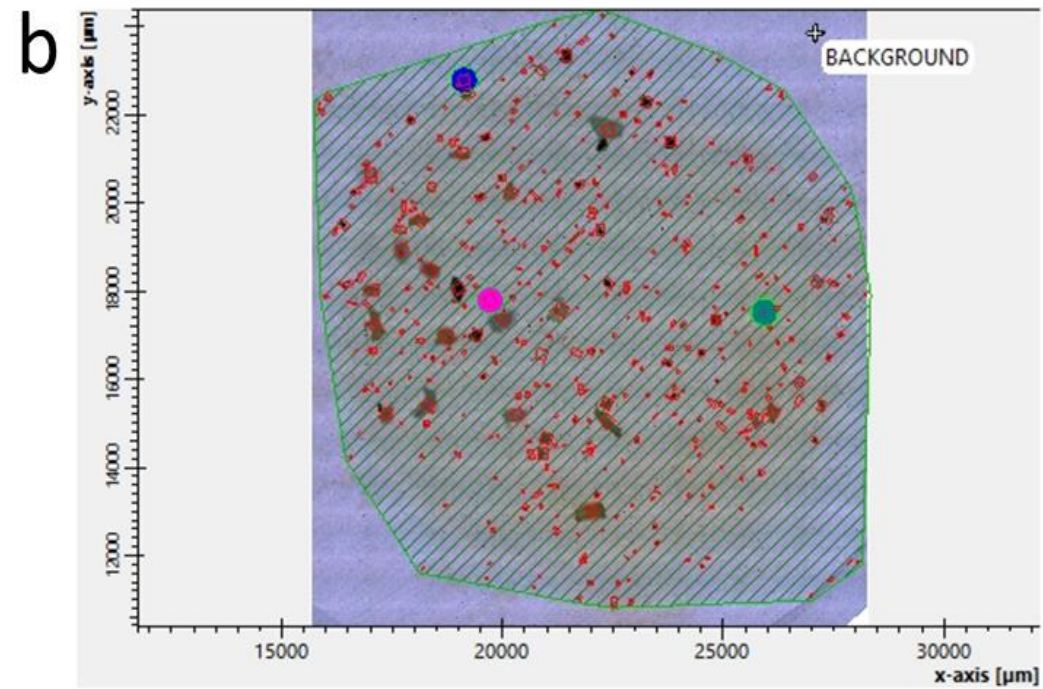
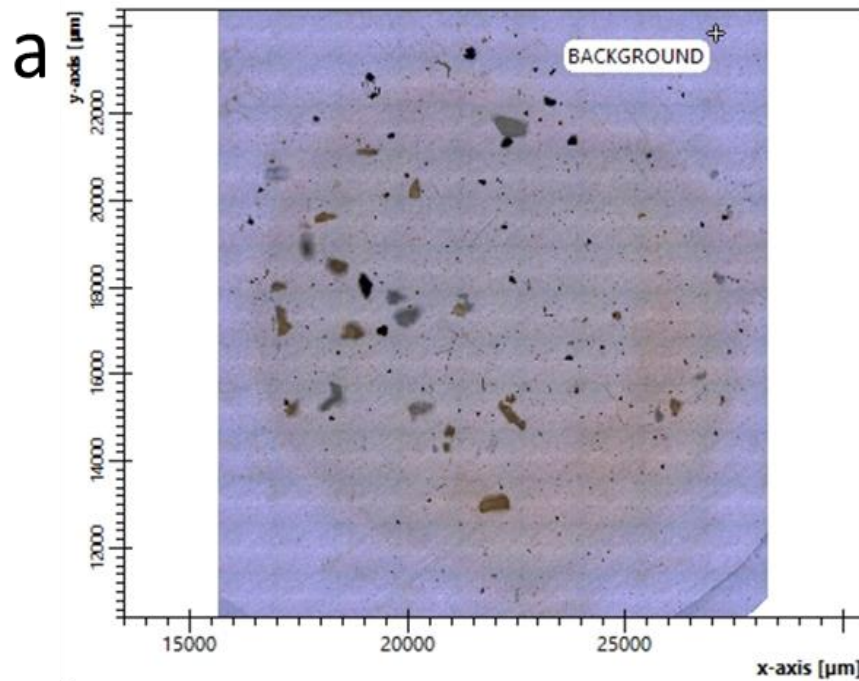
Analyse von Mikroplastik im Boden



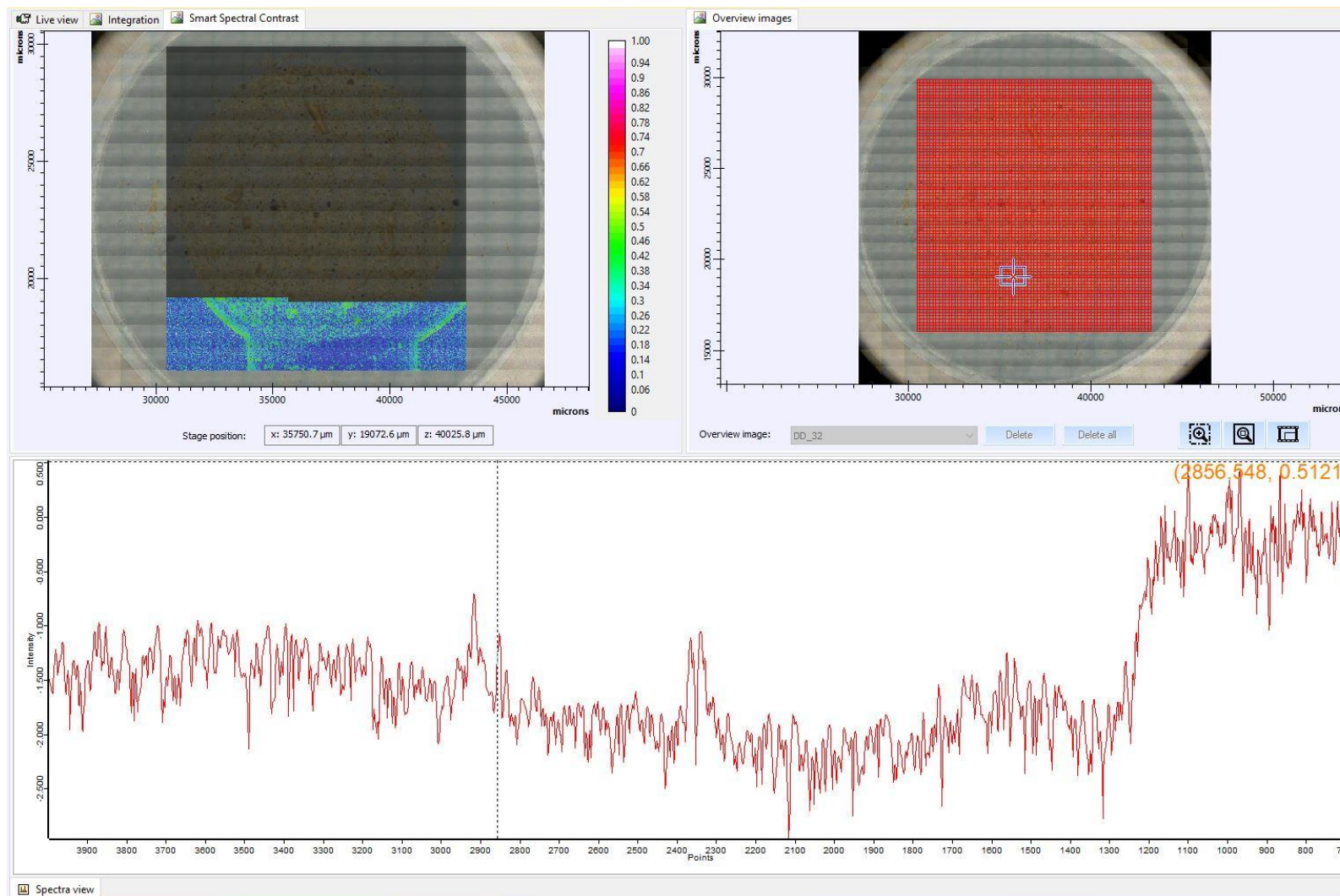
Analyse von Mikroplastik im Boden



Analyse von Mikroplastik im Boden: MCT



Analyse von Mikroplastik im Boden: FPA



Display Filter

Size 1

Relevance 0.00

Similarity 0.00

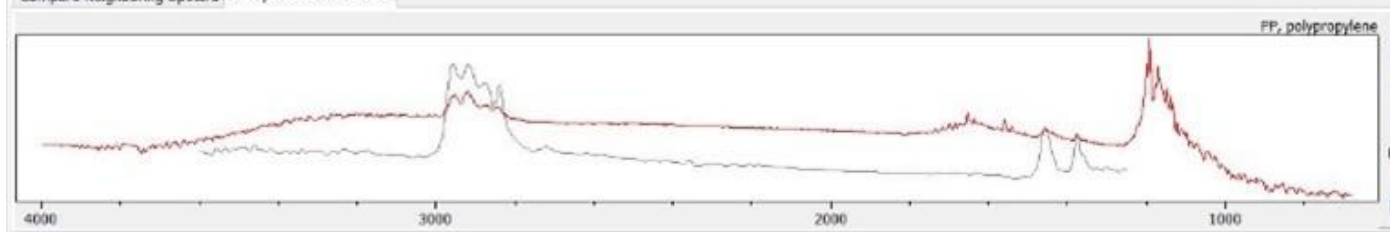
###	Class	No. of Particles	R<0.2	R<0.4	R<0.6	R<0.8	R>0.8
1	PP	3 particles	0	0	1	2	0
2	PE	594 particles	0	27	188	344	35
3	PVC	0 particles	0	0	0	0	0
4	PV	0 particles	0	0	0	0	0
5	PET	11 particles	0	0	5	6	0
6	PS	0 particles	0	0	0	0	0

Particles Distribution Parameters

PID	Cent.X [µm]	Cent.Y [µm]	Size[px]	Area [µm²]	Length [µm]	Width [µm]	Aspect	Dir(°)	Cl.	Cl. Name	Relevance	Similarity	Done
00001	35214	21904	20	587.0	35.36	24.84	1.426	102.6	1	PP	0.6613	0.7614	<input type="checkbox"/>
00002	39233	25466	26	763.1	47.68	32.36	1.473	137.3	1	PP	0.6908	0.7095	<input type="checkbox"/>
00003	39238	25493	2	58.70	10.85	5.412	2.000	0.0	1	PP	0.5200	0.0469	<input type="checkbox"/>
00750	34629	22408	4	117.4	16.27	10.82	1.500	0.0	8	PA	0.5833	0.3975	<input type="checkbox"/>
00753	34856	20373	2	58.70	10.85	5.412	2.000	0.0	8	PA	0.5133	0.3444	<input type="checkbox"/>
00754	34867	20368	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.4133	0.1900	<input type="checkbox"/>
00755	34943	23772	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.5067	0.2505	<input type="checkbox"/>
00756	35187	21190	19	557.7	44.71	22.51	1.983	21.5	8	PA	0.5481	0.4776	<input type="checkbox"/>
00759	35209	21185	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.6400	0.3793	<input type="checkbox"/>
00760	35214	20876	3	88.05	13.08	9.248	1.414	135.0	8	PA	0.6089	0.3224	<input type="checkbox"/>
00762	36001	24584	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.6667	0.2932	<input type="checkbox"/>
00763	36250	24281	2	58.70	10.82	5.423	2.000	90.0	8	PA	0.6200	0.2591	<input type="checkbox"/>
00764	37123	24730	9	264.2	21.88	17.41	1.256	145.4	8	PA	0.5422	0.4467	<input type="checkbox"/>
00765	37134	24719	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.4800	0.4422	<input type="checkbox"/>
00766	37313	19702	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.4533	0.3531	<input type="checkbox"/>
00767	37568	20011	5	146.8	17.42	12.26	1.419	18.4	8	PA	0.4427	0.2977	<input type="checkbox"/>
00768	37579	20005	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.5067	0.2733	<input type="checkbox"/>
00771	37682	24400	4	117.4	16.27	10.82	1.500	0.0	8	PA	0.5367	0.1999	<input type="checkbox"/>
00772	38587	19296	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.4667	0.2922	<input type="checkbox"/>
00774	38593	19312	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.4533	0.1838	<input type="checkbox"/>
00776	38598	19329	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.4533	0.2547	<input type="checkbox"/>
00777	38642	20038	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.4800	0.2652	<input type="checkbox"/>
00778	38918	20508	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.5600	0.2938	<input type="checkbox"/>
00779	39884	22819	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.4400	0.1879	<input type="checkbox"/>
00780	39889	22809	2	58.70	10.82	5.423	2.000	90.0	8	PA	0.5533	0.2826	<input type="checkbox"/>
00781	40285	21039	3	88.05	16.27	5.412	3.000	0.0	8	PA	0.5244	0.2789	<input type="checkbox"/>
00782	40296	19653	1	29.35	5.418	5.418	1.000	0.0	8	PA	0.5333	0.1623	<input type="checkbox"/>
00783	40410	21634	5	146.8	16.27	10.82	1.500	0.0	8	PA	0.5840	0.3403	<input type="checkbox"/>
00784	40556	20379	4	117.4	17.40	10.57	1.649	108.4	8	PA	0.5033	0.1675	<input type="checkbox"/>

Spec 1 Spec 2 Spec 3 Spec 4

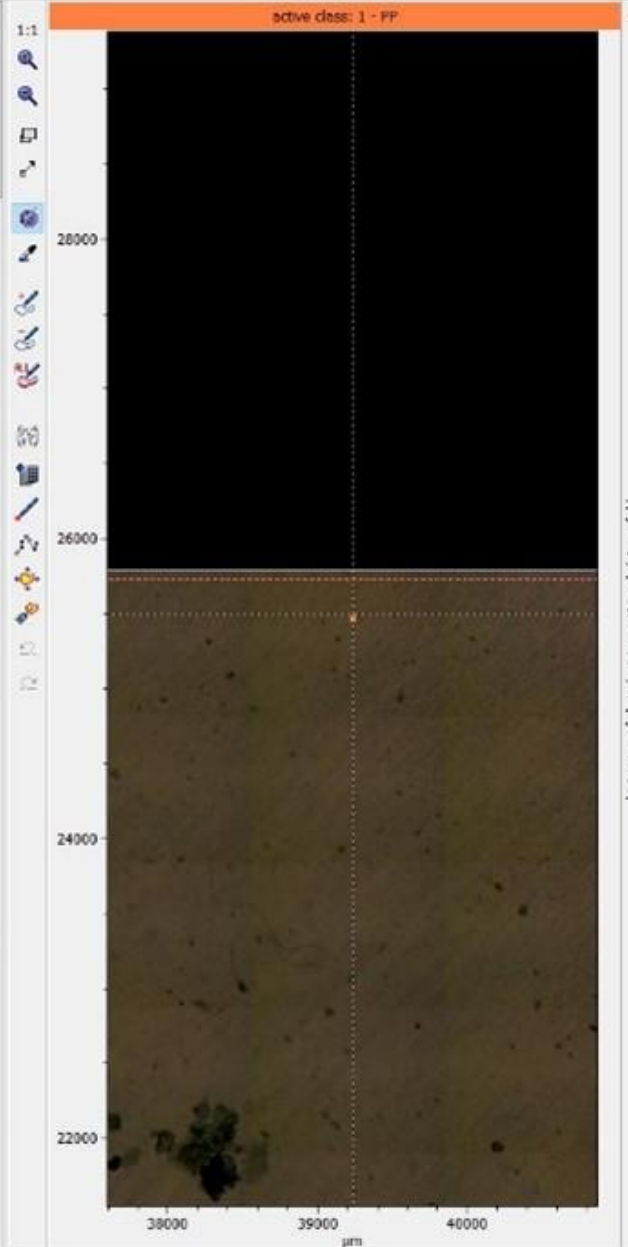
Compare Neighboring Spectra Compare to References



PP, polypropylene

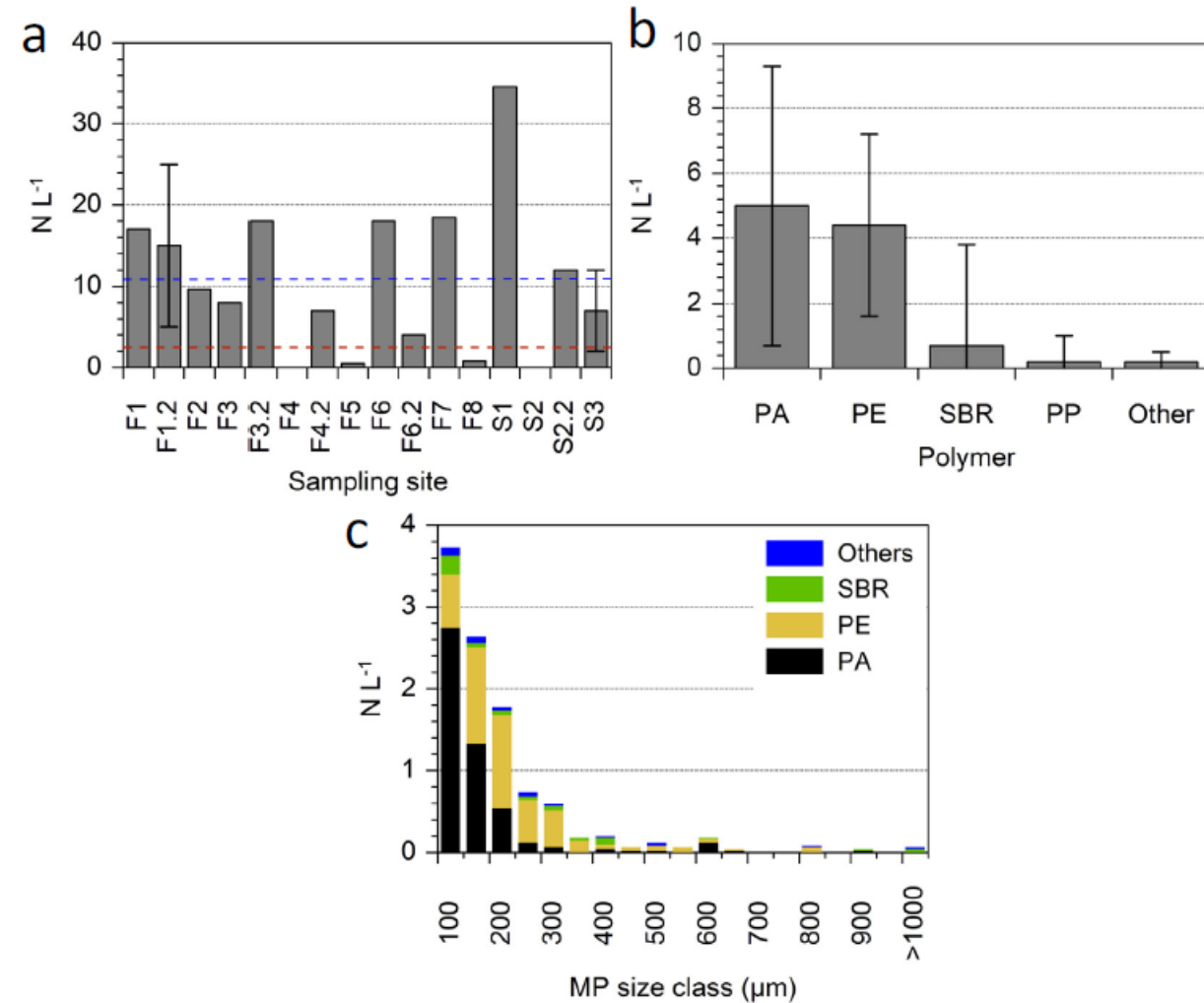
Ref. Spectra

- PE, polyeth...
- PP, polypr...
- PP, polypr...
- PP, polypro...
- PP, polypro...
- PP, polypro...
- POM, solv...

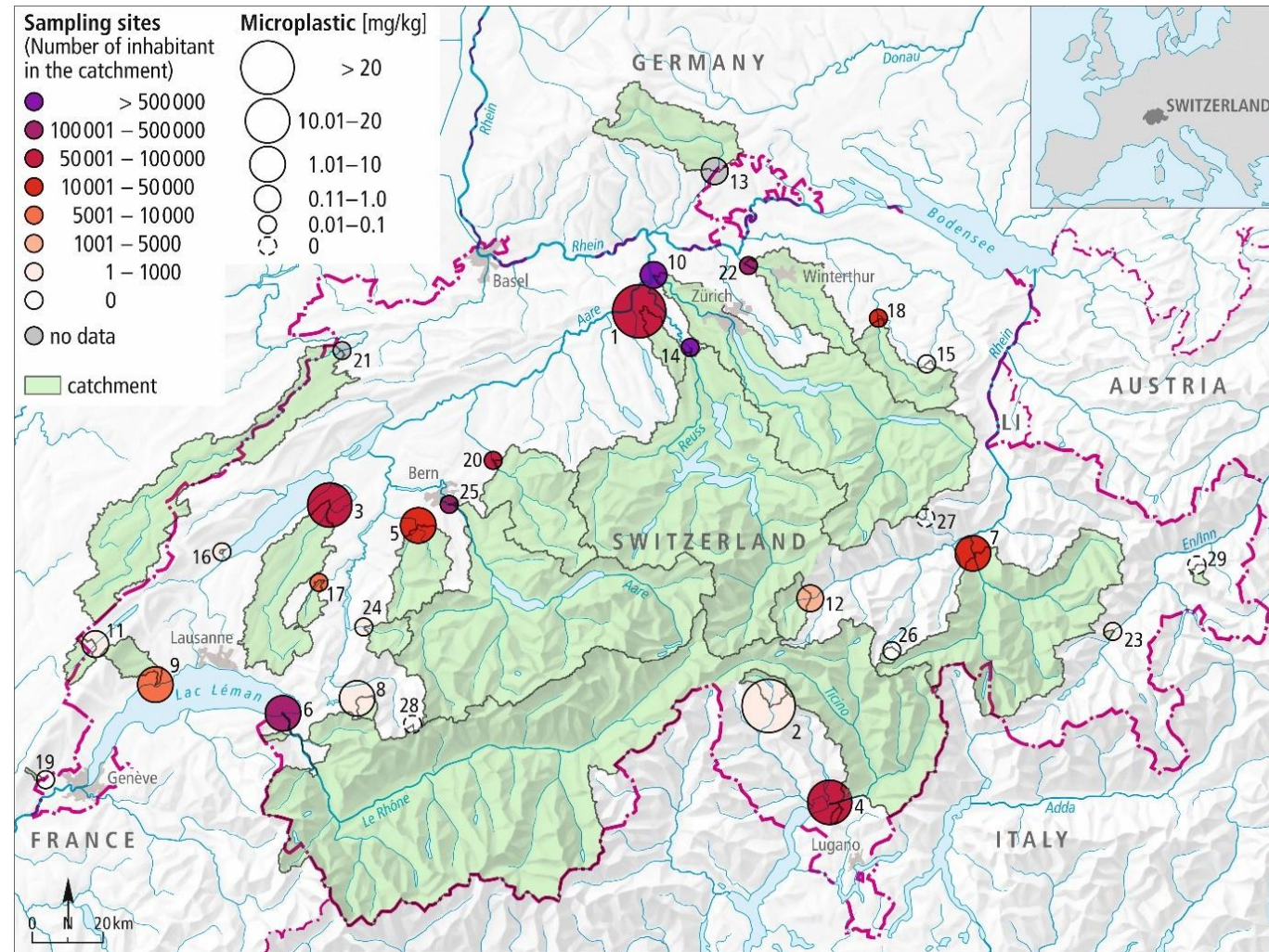




Anwendungen



Anwendungen



Scheurer and Bigalke, 2018

Thank you for listening...

