

Supplementary Material

Desorption of Organic Micropollutants from Loaded Granular Activated Carbon

Daniela Reif ^{1,*}, Ernis Saracevic ¹, Monika Šabić Runjavec ², Julia Haslinger ¹, Heidemarie Schaar ¹ and Norbert Kreuzinger ¹

¹ Institute of Water Quality and Resource Management, TU Wien, Karlsplatz 13/226-1, 1040 Vienna, Austria; daniela.reif@tuwien.ac.at (D.R.); ernis.saracevic@tuwien.ac.at (E.S.); julia.haslinger@denkstatt.at (J.H.); hschaar@iwag.tuwien.ac.at (H.S.); norbkreu@iwag.tuwien.ac.at (N.K.)

² Faculty of Chemical Engineering and Technology, University of Zagreb, Marulićev trg 19, 10-000 Zagreb, Croatia; msabic@fkit.hr

* Correspondence: daniela.reif@tuwien.ac.at

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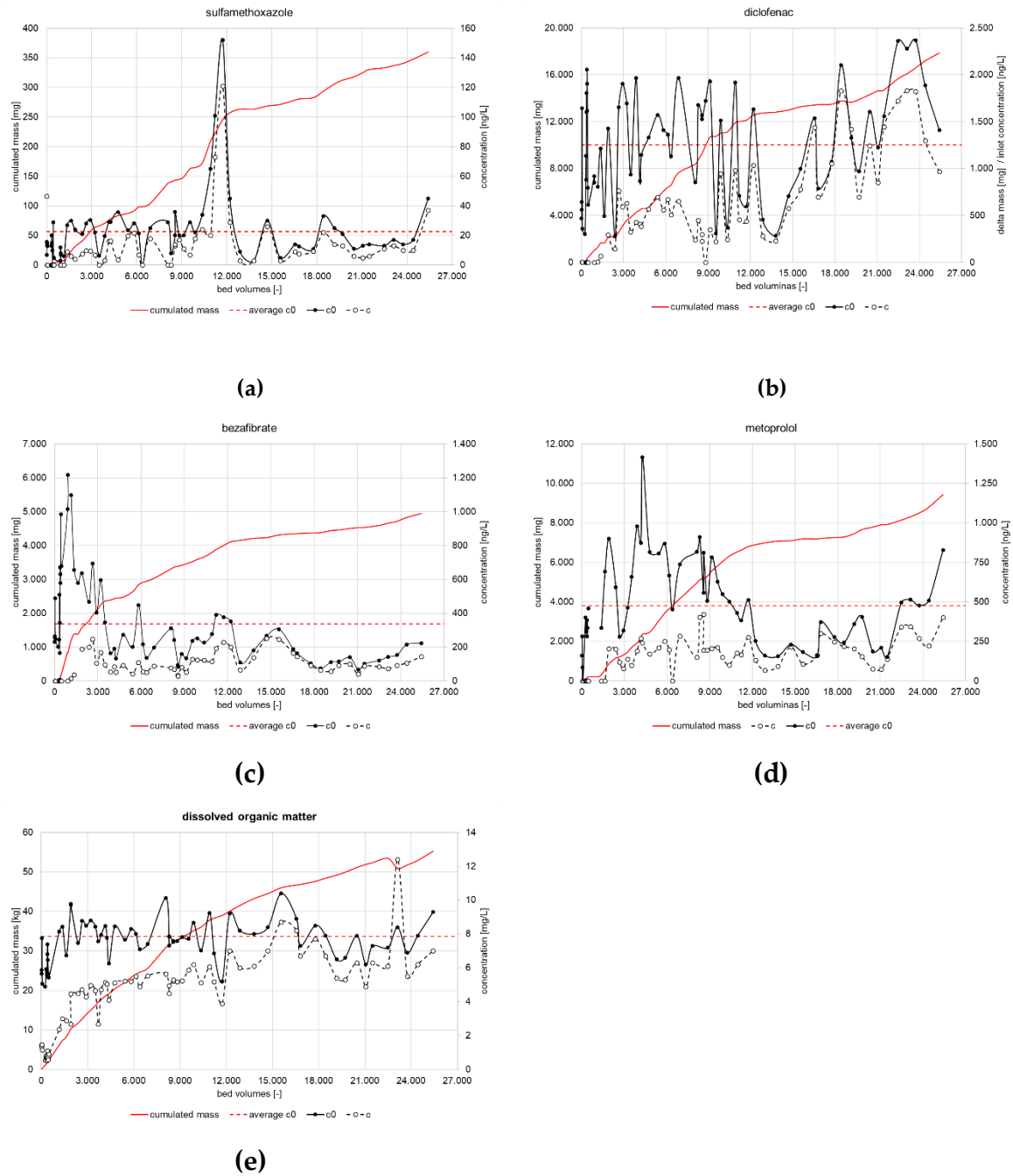


Figure S1. Cumulated mass (mg) and feed and effluent concentrations (ng/L) of (a) sulfamethoxazole, (b) diclofenac, (c) bezafibrate and (d) metoprolol and cumulated adsorbed mass of DOC (e).

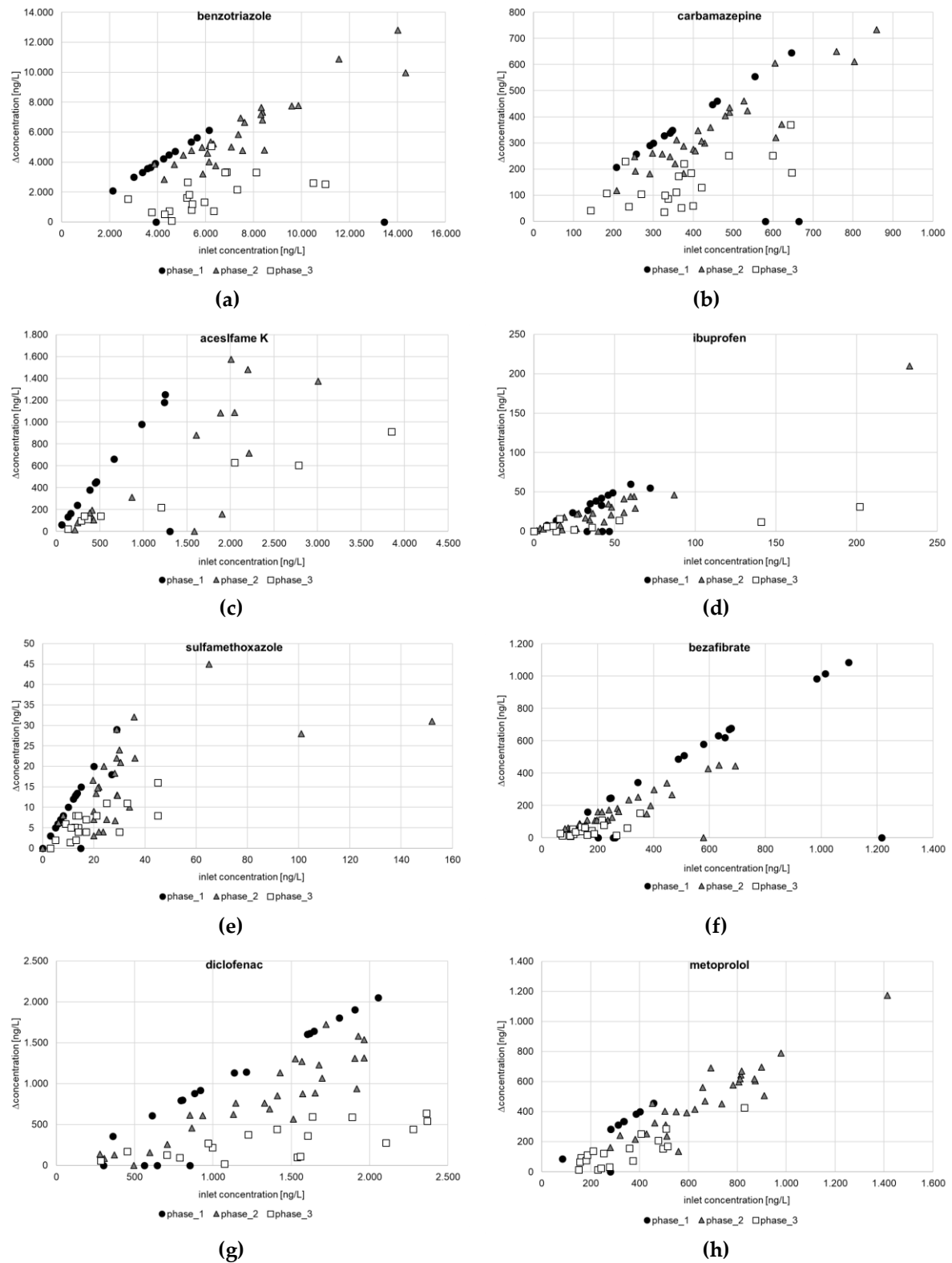


Figure S2. Relation between the Δ concentrations (adsorbed concentrations) and feed concentrations of the substances (a) benzotriazole, (b) carbamazepine, (c) acesulfame K, (d) ibuprofen, (e) sulfamethoxazole, (f) bezafibrate, (g) diclofenac and (h) metoprolol during the 27-month operation of the pilot-scale filter.

Table S1. Concentrations of all analyzed substances during backwashing at 2860 bed volumes. IN represents the feed concentration at the time of backwashing; OUT, the outlet concentration before backwashing. BACK_1 was measured at the beginning of backwashing (flow, 5 m³/h), and BACK_2, after 30 minutes of backwashing (flow, 30 m³/h). The organic micropollutant concentrations in the WELL WATER used for backwashing were measured.

	BTA	CBZ	ACS	IBP	SMX	DCF	BZF	MET
IN	7632	298	2007	56	24	1428	635	899
OUT	980	38	434	15	4	294	187	203
WELL WATER	160	28	53	0	0	0	0	42
BACK_1	7464	246	1740	25	19	1065	429	629
BACK_2	115	7	75	0	0	0	2	20

Table S2. Concentrations of all analyzed substances during backwashing at 3960 bed volumes. IN represents the feed concentration at the time of backwashing; OUT, the outlet concentration before backwashing. BACK_1 was measured at the beginning of backwashing (flow, 5 m³/h), and BACK_2, after 30 minutes of backwashing (flow, 30 m³/h). The organic micropollutant concentrations in the WELL WATER used for backwashing were measured.

	BTA	CBZ	ACS	IBP	SMX	DCF	BZF	MET
IN	7073	401	2048	37	28	1653	693	280
OUT	2075	126	961	14	10	765	248	119
WELL WATER	0	34	50	0	0	137	-3	2
BACK_1	8489	485	931	14	18	993	297	319
BACK_2	46	34	283	0	0	581	53	23

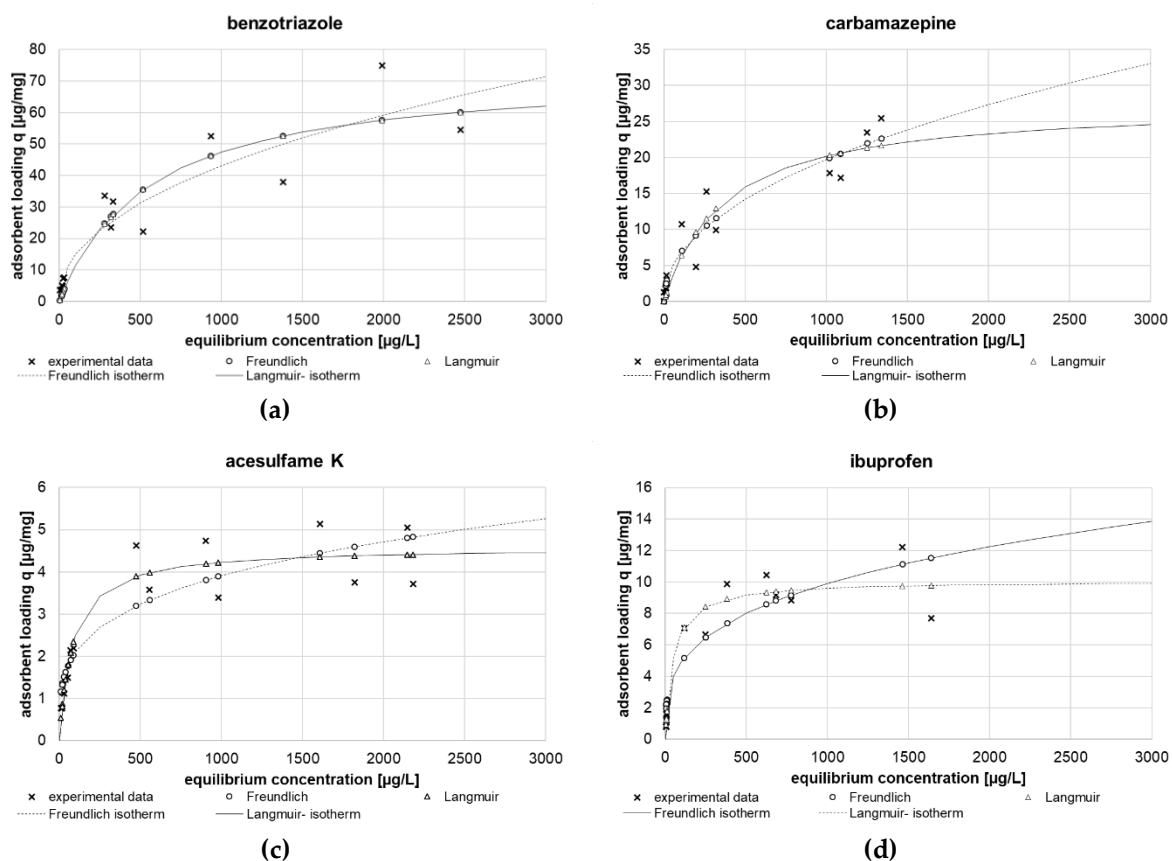


Figure S3. Results of adsorption batch experiments for the determination of Freundlich and Langmuir isotherm parameters of (a) benzotriazole, (b) carbamazepine, (c) acesulfame K, (d) ibuprofen.

Table S3. Theoretical extraction efficiencies for GAC and powdered GAC (ground with a lab mill), representing the ratio between desorbed loadings at an AC/solvent ratio of 10 g/L and the cumulated loadings.

	GAC (10 g/L)	pGAC (10 g/L)
metoprolol	0.86%	1.83%
benzotriazole	6.85%	14.18%
sulfamethoxazole	-	-
carbamazepine	8.14%	9.71%
Acesulfame K	0.50%	3.71%
bezafibrate	2.44%	1.99%
diclofenac	1.52%	0.92%
ibuprofen	26.17%	32.30%