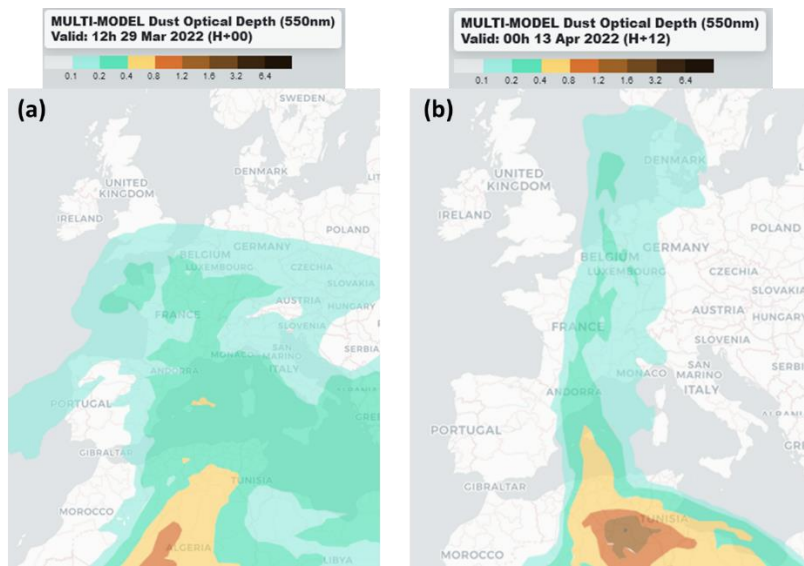## Supplement S1

Figure S1. Dust aerosol optical depth (AOD) multi-model simulation provided by the WMO Barcelona Dust Regional Centre from North Africa to Western Europe (https://dust.aemet.es, Basart et al., 2019) for (a) 29 March 2022 at 12h00 and (b) 13 April 2022 at 00h00.

Supplement S2

Table S2. Washout ratios of elements for the selected rain events R2, R3 and R8

Element	Al	Ba	Ca	Cl	Co	Cr	Fe	K	Mg	Mn	Na	P	S	Si	Ti	Zn
R2	1 699	827	2 580	3 058	1 278	485	617	1 835	1 449	1 219	1 625	5 291	2 630	2 056	2 492	1 029
R3	4 436	2 566	9 775	69 618	6 272	3 194	3 806	4 701	7 793	4 733	11 119	16 699	3 223	5 423	7 342	3 792
R8	3 819	1 298	5 472	14 402	917	483	1 555	3 606	4 183	2 009	3 002	2 966	4 444	3 579	3 699	2 327

Supplement S3

Table S3. Mass median diameter (MMD) of elements (Elichegaray, 1980 and Koutrakis, 1984 in Jaffrezo and Colin, 1988) and mean washout ratios for selected rain events (R2, R4 and R8) compared to WR of Jaffrezo and Colin (1988).

Element	MMD (µm)	WR R2	WR R3	WR R8	WR Jaffrezo and Colin, 1988
Cl	0.6	1 648	65 016	1 746	2 941
K	0.7	835	3 256	706	951
Zn	1.0	265	1 469	384	767
S	1.1	1 093	2 791	654	743
Na	1.6	936	11 588	379	444
Mg	1.7	425	6 027	587	596
Mn	1.8	316	2 071	366	146
Fe	2.3	110	1 403	324	184
Al	3.3	261	1 954	625	291
Ti	3.3	321	2 447	615	305
Si	3.4	292	2 051	564	373
Ca	4.7	587	4 158	790	1 048

Supplement S4

Table S4. Decrease Factor (DF), which correspond to the ratio of the mass concentration of the first fraction to the last fraction, of the particulate and dissolved phases and the ratio of the decrease factor of the particulate to the dissolved phase.

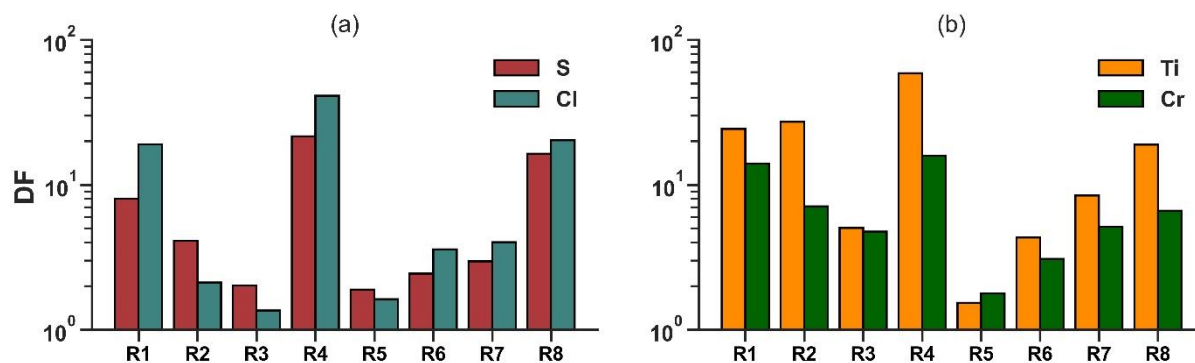| Rain event	DF for particulate phase	DF for dissolved phase	DF particulate /DF dissolved
R1	28.7	16.5	1.7
R2	19.9	2.7	7.3
R3	3.6	1.5	2.3
R4	49.3	22.1	2.2
R5	3.6	1.8	2.0
R6	5.3	1.9	2.8
R7	10.5	2.6	4.0
R8	15.0	10.9	1.4

Supplement S5

Figure S5. Decrease Factor (DF), which correspond to the ratio of the mass concentration of the first fraction to the last fraction, of (a) Cl in blue and S in red, and (b) of Ti in orange and Cr in green.
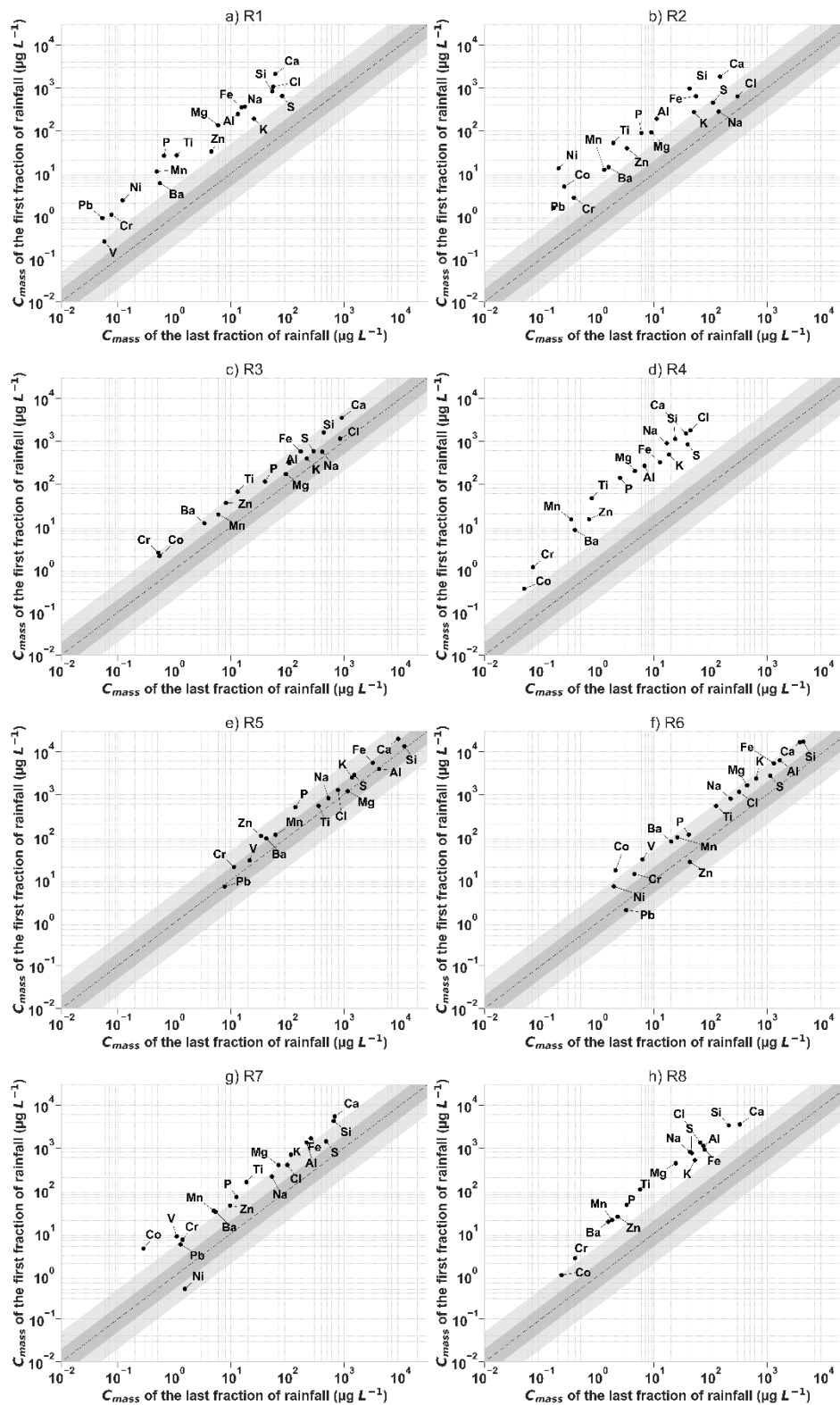
Supplement S6

Figure S6. Element mass concentration in the first fraction of rainfall as a function of elemental mass concentration in the last fraction of (a) R1, (b) R2, (c) R3, (d) R4, (e) R5, (f) R6, (g) R7 and (h) R8. The dotted line represents a 1:1 fit, while the dark and light grey envelopes represent a factor 2 and 5 deviation, respectively.

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