atmosphere

Supplementary Materials: Chemical Characterization and Health Risk Assessment of Particulate Matter from Household Activities in Bamako, Mali, Western Sub-Saharan Africa

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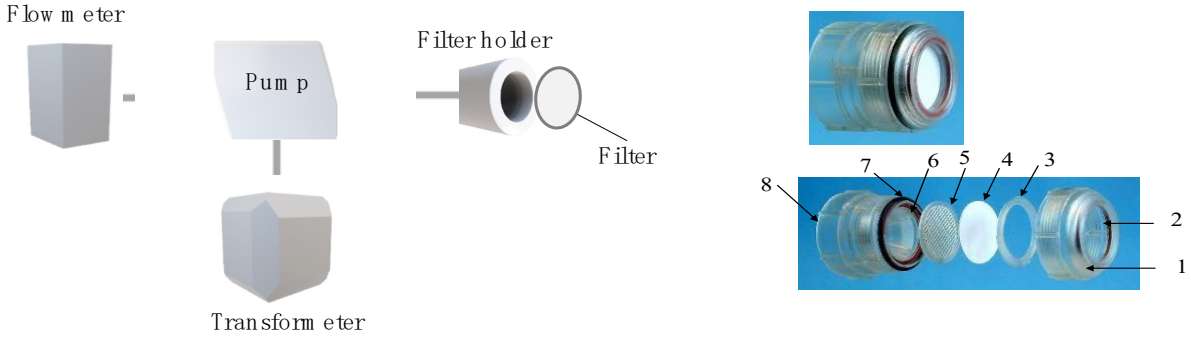

(**a**) (**b**)

Figure S1. In situ sampling system. **(a)** Schematic of the NILU filter holder system used in Bamako, **(b)** Photograph of the sampling system.

Nomenclature for Figure S1. (1) Inlet, (2 and 6) Silicone O-rings (red); (3) Champing ring; (4) quartz or PTFE filter; (5) filter backing; (7) nitrile O-ring (black); (8) outlet section. The difference in the Nilu filter holder system for both settings (Figure 1 and S2) resulted in the type of inlet.

(**a**) (**b**)

Figure S2. In situ sampling images. (a) Insecticide and incense combustion sampling, (b) Cooking period sampling.

Figure S3. Collected filter samples in plastic boxes and zip logs.

(**a**) (**b**)

Figure S4. Different IST and ICS products. (a); most popular IST in Bamako © Maliweb.net, (b); Traditional made ICS in Bamako.

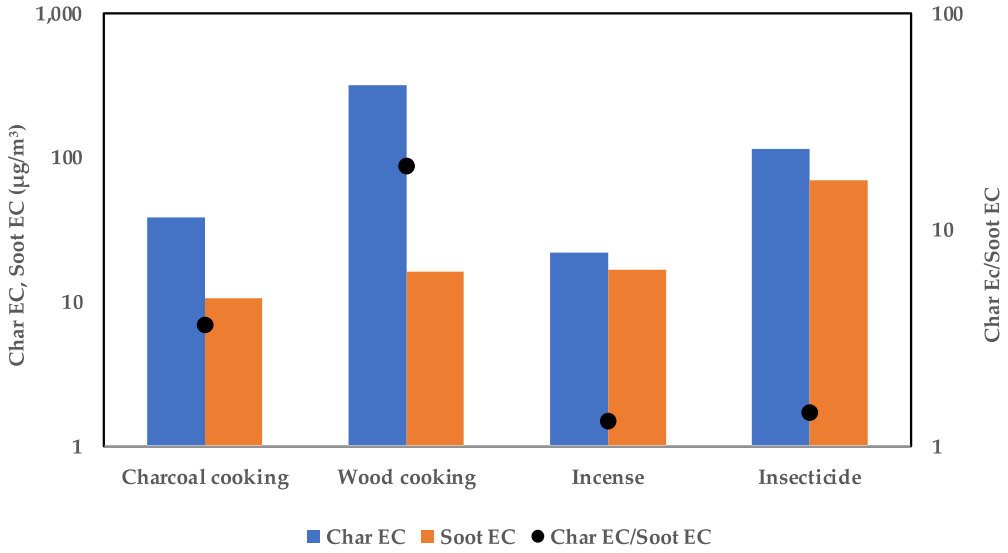

Figure S5. Average Char elemental carbon and Soot elemental carbon concentrations and Char elemental carbon/Soot elemental carbon ratio in different particulate matter samples collected by in-situ samplings (Charcoal cooking; Wood cooking; IST: Insecticide; ICS: Incense)

Table S1. Average concentration of the particulate matter components for different emission sources collected in situ (values are in µg/m³). ICS: Incense; IST: insecticides; CHL: Charcoal cooking; Wood: Wood Cooking. nd was used for samples having lower values then the blank samples

		ICS (4)	IST (4)	CHL (2)	Wood (2)	Roadside (3)
Ionic compounds	SO_4^{2-}	1.70×10^1	3.30	1.10×10^1	4.00×10^1	2.70
	NO_3^-	6.70	3.50	7.20	1.80×10^1	1.90
	Cl^-	1.00×10^1	2.30×10^1	6.60	5.00×10^1	9.70×10^{-1}
	F^-	2.00×10^1	5.80×10^1	3.10	8.20	1.40×10^{-1}
	NO_2^-	2.60×10^1	nd	nd	nd	nd
	Br^-	6.20×10^1	nd	nd	nd	nd
	NH_4^+	2.50	2.10×10^1	1.70	3.80	3.10×10^{-1}
	Na^+	1.30	2.00	1.40×10^1	2.70	8.90×10^{-1}
	K^+	1.70×10^1	1.30×10^1	1.40×10^1	8.60×10^1	1.20
	Mg^{2+}	5.00	1.30	5.10	9.20	4.30×10^{-1}
	Ca^{2+}	2.30×10^1	9.90	3.10×10^1	5.70×10^1	8.70
Carbonaceous components	OC	2.00×10^3	5.20×10^3	3.50×10^2	2.30×10^3	2.80×10^1
	EC	3.30×10^1	1.70×10^2	5.00×10^1	2.90×10^2	5.80
Metallic elements	Li	5.20×10^{-3}	3.10×10^{-3}	1.10×10^{-2}	1.50×10^{-2}	4.60×10^{-3}
	Be	1.50×10^{-4}	1.50×10^{-3}	1.70×10^{-3}	2.50×10^{-3}	4.10×10^{-4}
	Na	1.70	1.60	3.80	5.10	1.90
	Mg	4.20	1.00	7.80	1.30×10^1	3.50
	Al	1.30×10^1	3.50	2.10×10^1	3.70×10^1	2.20×10^1
	K	1.50×10^1	1.20×10^1	1.80×10^1	8.40×10^1	4.20
	Ca	3.60	9.00×10^{-1}	1.00×10^1	1.50×10^1	2.40
	Sc	1.30×10^{-3}	nd	2.20×10^{-3}	4.80×10^{-3}	4.80×10^{-3}

	V	2.30×10^{-2}	8.20×10^{-3}	3.70×10^{-2}	7.20×10^{-2}	5.80×10^{-2}
	Cr	6.60×10^{-2}	1.50×10^{-2}	5.60×10^{-2}	9.50×10^{-2}	7.60×10^{-2}
	Mn	2.30×10^{-1}	4.30×10^{-2}	4.10×10^{-1}	7.00×10^{-1}	2.10×10^{-1}
	Fe	1.10×10^{1}	2.80	1.70×10^{1}	2.90×10^{1}	2.30×10^{1}
	Co	4.60×10^{-3}	5.40×10^{-4}	5.80×10^{-3}	1.20×10^{-2}	6.50×10^{-3}
	Ni	1.80×10^{-2}	2.40×10^{-3}	5.90×10^{-2}	3.80×10^{-2}	1.70×10^{-2}
	Cu	1.90×10^{-2}	1.40×10^{-2}	3.20×10^{-2}	7.10×10^{-2}	2.70×10^{-2}
	Zn	2.50	1.60×10^{-1}	5.30	1.20×10^{1}	1.10×10^{-1}
	Ga	3.70×10^{-2}	1.90×10^{-2}	7.10×10^{-2}	1.60×10^{-1}	3.80×10^{-2}
	As	3.00×10^{-3}	3.10×10^{-3}	4.80×10^{-3}	7.10×10^{-3}	4.80×10^{-3}
	Se	nd	7.90×10^{-4}	3.00×10^{-4}	1.70×10^{-2}	1.60×10^{-3}
Metallic elements	Rb	5.10×10^{-2}	8.00×10^{-2}	5.60×10^{-2}	2.20×10^{-1}	1.60×10^{-2}
	Sr	1.60×10^{-1}	3.20×10^{-2}	3.50×10^{-1}	7.20×10^{-1}	6.60×10^{-2}
	Y	nd	nd	nd	7.20×10^{-2}	3.80×10^{-2}
	Mo	nd	1.90×10^{-2}	nd	nd	9.40×10^{-3}
	Ag	nd	nd	nd	4.40×10^{-4}	1.70×10^{-4}
	Cd	1.40×10^{-3}	4.10×10^{-3}	1.40×10^{-3}	3.70×10^{-3}	4.80×10^{-4}
	In	3.00×10^{-5}	nd	8.00×10^{-5}	1.20×10^{-4}	4.00×10^{-5}
	Sb	4.80×10^{-3}	1.10×10^{-3}	4.50×10^{-3}	7.90×10^{-3}	3.70×10^{-3}
	Cs	1.20×10^{-3}	2.60×10^{-3}	1.60×10^{-3}	4.20×10^{-3}	7.60×10^{-4}
	Ba	1.70×10^{-1}	8.90×10^{-2}	3.20×10^{-1}	7.20×10^{-1}	1.60×10^{-1}
	Hg	nd	nd	nd	nd	nd
	Ti	2.10×10^{-3}	8.90×10^{-3}	1.50×10^{-3}	7.70×10^{-3}	1.20×10^{-4}
	Pb	4.00×10^{-2}	4.80×10^{-2}	8.80×10^{-2}	2.70×10^{-1}	2.00×10^{-2}
	Bi	2.00×10^{-5}	2.20×10^{-3}	nd	nd	1.20×10^{-4}
	Th	7.40×10^{-4}	3.00×10^{-4}	nd	4.90×10^{-3}	3.80×10^{-3}
	U	nd	1.80×10^{-3}	nd	1.00×10^{-3}	1.00×10^{-3}