

Supplementary material

PMF solution

PMF analysis based on ACSM measurements was conducted according to Paglione et al. (2020)[56]. The ME-2 solver [57] and SoFi v6.61 software [58] were utilised to attribute OA mass spectra (signals from m/z 18 to 120) to several OA factors. After running the PMF from two to seven factors, the HOA, BBOA, and cooking OA factors were constrained with a range of α -values ($\alpha=0.05, 0.10, 0.15, 0.20$ for HOA; $\alpha=0.1, 0.2, 0.3, 0.4, \text{ and } 0.5$ for others) to examine each attribution and potential mixing between factors. To establish the local HOA profile, the BC attributed to fossil fuel was used as time series constrain and during this step a stable hydrocarbon-like spectra appeared. In addition, with the local HOA locked in, a local BBOA factor was established. The outdoor air factors were then constrained for the indoor air data. After each step of the analysis, residual plots, diurnal trends, and correlations with external time series (e.g. different BC and secondary inorganic aerosol species) were observed.

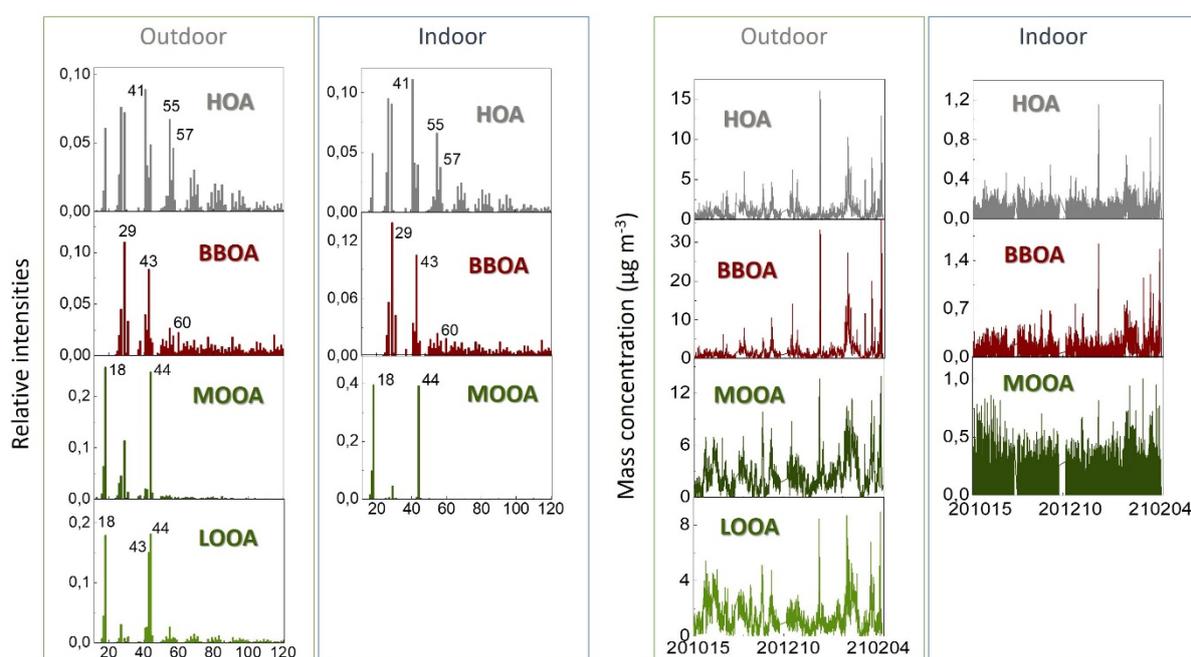


Fig S1. PMF solution profiles and time series.

The source apportionment of OA led to the identification of various components tracing both primary and secondary OA sources. Outdoors, two main primary OA factors were identified: HOA coming from fossil fuel combustion and BBOA mainly connected to domestic heating. The remaining fraction of sub-micrometer OA consisted of more and less oxidized OA (MOOA and LOOA respectively). In indoor air, three factors were found: HOA, BBOA, and one secondary OA (MOOA). Both indoor and outdoor HOA profiles were characterized by peaks matching hydrocarbons, such as m/z 27, 41, 43, 55, 57. Outdoor HOA had a strong correlation with BC_{ff} ($r=0.84$) while in indoor air this correlation was not significant ($r=0.42$). HOA contribution to the total OA reached 21.9% and 14.8% in indoor and outdoor air, respectively. The BBOA from indoor and outdoor showed similarities with BBOA from a previous study from Vilnius and had characteristic peaks at m/z 29, 43 and 60. According to Cubison et al. (2011) [59], biomass burning marker is present in the OA when intensity of m/z 60 is higher than 0.3%. In our study, intensities of m/z 60 reached 2.2% and 0.4% of outdoor and indoor BBOA factors, respectively, indicating an influence of biomass burning. Additionally, time series of BBOAs showed a good agreement with BC_{bb} ($r=0.69$ in indoor and $r=0.93$ in outdoor air). The total OA in

outdoor air was predominantly comprised of MOOA (37.5%). Its mass spectra had two significant peaks: m/z 18 and 44. Its time series strongly correlated with NO_3^- ($r=0.80$) and NH_4^+ ($r=0.76$). Another secondary OA, LOOA had a lower contribution to the total OA (20.3%) and its mass spectra showed significant signals at m/z 18, 43, and 44. A higher m/z 43 is typically associated with less advanced oxidation processes. Meanwhile, in indoor air only MOOA factor was identified which contributed to the total OA by 37.8%. The similarity between indoor and outdoor OA factors was compared in terms of theta angle (θ) between spectra based on Kostenidou et al. 2009 [60]. Here, mass profiles were treated as vectors and small differences within vectors ($\theta < 15^\circ$) indicated a great similarity, moderate differences ($15^\circ < \theta < 30^\circ$) showed limited similarity, while $\theta > 30^\circ$ meant that two mass spectra did not compare well. As seen in Table S1, a great similarity was found between indoor and outdoor primary OA factors. Meanwhile, indoor MOOA was just somewhat similar to outdoor MOOA.

Table S1 θ values for different indoor and outdoor factors

		Indoor		
		HOA	BBOA	MOOA
Outdoor	HOA	10.4	47.7	64.5
	BBOA	42.3	8.4	82.7
	LOOA	61.3	65.6	32.0
	MOOA	58.7	71.2	15.9

Table S2. Correlations between the same aerosol chemical component or factor in outdoor versus indoor air.

Component	r
OA	0.65
NO3	0.62
SO4	0.54
NH4	0.10
Cl	0.13
HOA	0.71
BBOA	0.69
BC	0.90
BCbb	0.55
BCff	0.73
Na	0.19

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