

1 Supporting Information

2

3 Table S1. Mass concentrations of chemical components of particles inside and outside the residence during entire measuring period

Total monitoring period												
	Indoors, 15.0 $\mu\text{g m}^{-3}$						Outdoors, 7.0 $\mu\text{g m}^{-3}$					
	Organic matter	NO <sub>3</sub>	SO <sub>4</sub>	NH <sub>4</sub>	Chl	BC	Organic matter	NO <sub>3</sub>	SO <sub>4</sub>	NH <sub>4</sub>	Chl	BC
Average	13.5	0.3	0.6	0.2	0.04	0.9	2.4	2.3	1.1	1.0	0.2	0.9
STD	191.6	5.6	0.8	0.9	0.2	1.5	2.6	2.5	1.1	0.9	0.2	0.7
Maximum	15711.9	540.8	14.0	76.8	17.6	99.6	143.4	11.8	7.1	3.7	1.9	6.6
Minimum	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1
I/O ratio	5.5	0.1	0.6	0.2	0.2	1.0						

4

5

6

7

8

9

10

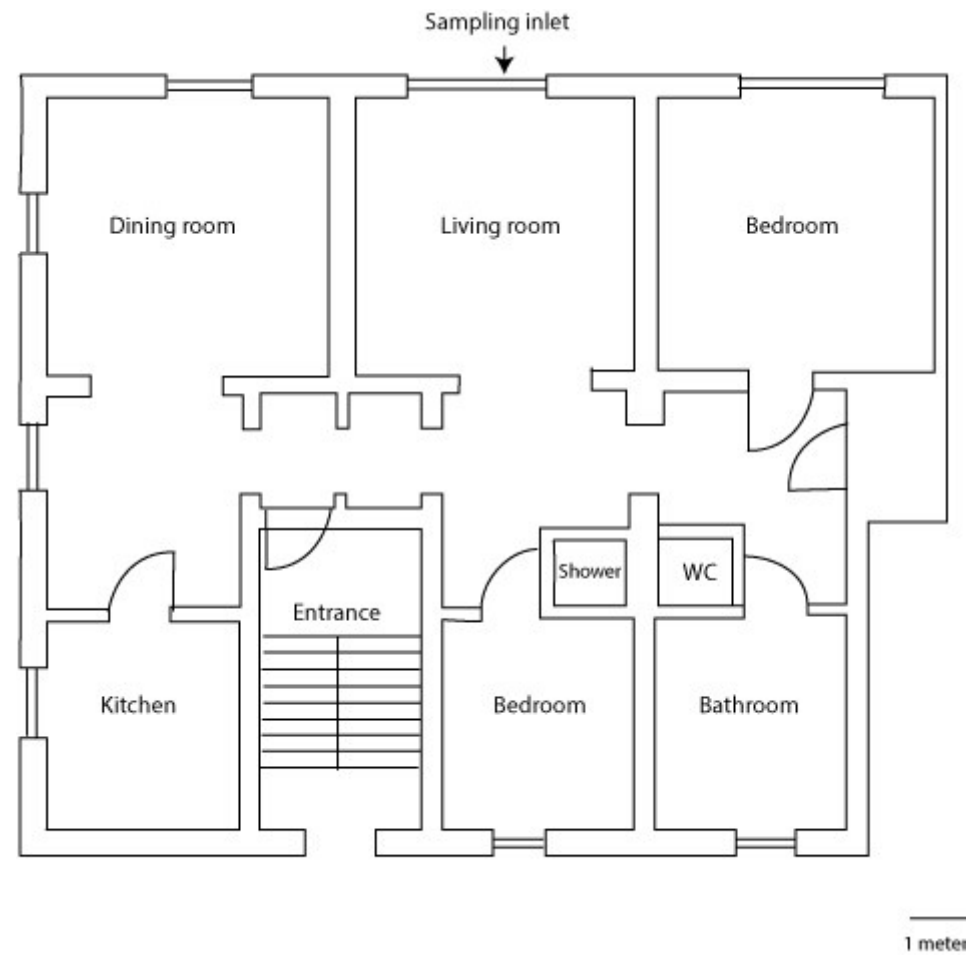
11

12

13 Table S2. Mass concentrations of chemical components of particles inside and outside the residence during active indoor sources and no active indoor sources

Activity periods												
Indoors, 16.7 $\mu\text{g m}^{-3}$							Outdoors, 6.6 $\mu\text{g m}^{-3}$					
	Organic matter	NO <sub>3</sub>	SO <sub>4</sub>	NH <sub>4</sub>	Chl	BC	Organic matter	NO <sub>3</sub>	SO <sub>4</sub>	NH <sub>4</sub>	Chl	BC
Average	15.3	0.3	0.6	0.2	0.2	0.7	2.3	2.2	1.0	0.9	0.2	0.6
STD	205.6	6.0	0.8	1.0	0.2	2.0	2.7	2.6	1.0	1.0	0.3	0.5
Maximum	15711.9	540.8	14.0	76.8	17.6	81.7	143.4	11.8	6.9	3.7	1.9	4.4
Minimum	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1
I/O ratio	6.7	0.1	0.6	0.2	1.1	1.1						
Non-activity periods												
Indoors, 3.4 $\mu\text{g m}^{-3}$							Outdoors, 9.5 $\mu\text{g m}^{-3}$					
	Organic matter	NO <sub>3</sub>	SO <sub>4</sub>	NH <sub>4</sub>	Chl	BC	Organic matter	NO <sub>3</sub>	SO <sub>4</sub>	NH <sub>4</sub>	Chl	BC
Average	1.8	0.1	0.9	0.3	0.2	0.5	3.6	2.6	1.9	1.2	0.2	1.1
STD	0.7	0.1	0.6	0.2	0.1	0.2	1.6	2.0	1.3	0.9	0.1	0.4
Maximum	4.0	0.7	2.1	0.7	0.2	1.8	14.5	8.5	7.1	3.7	0.6	2.0
Minimum	0.4	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.2	0.1	0.1	0.2
I/O ratio	0.5	0.1	0.5	0.2	0.9	0.5						

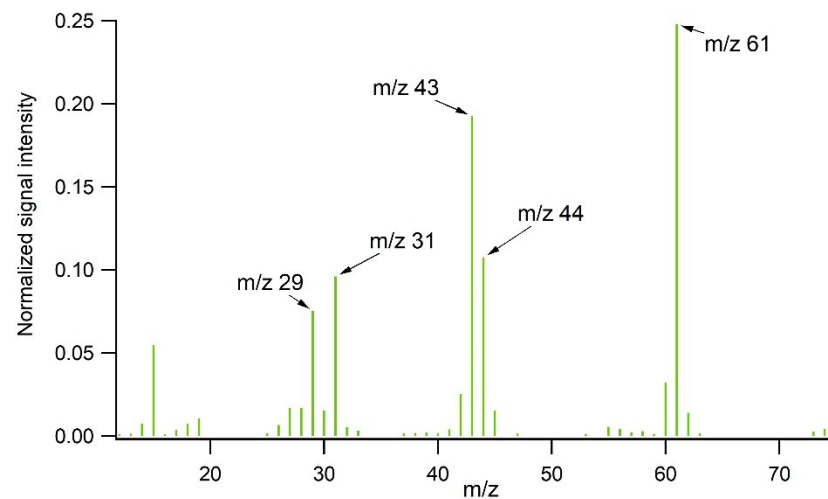
14



15

16

Figure S1. Sketch of the apartment



17

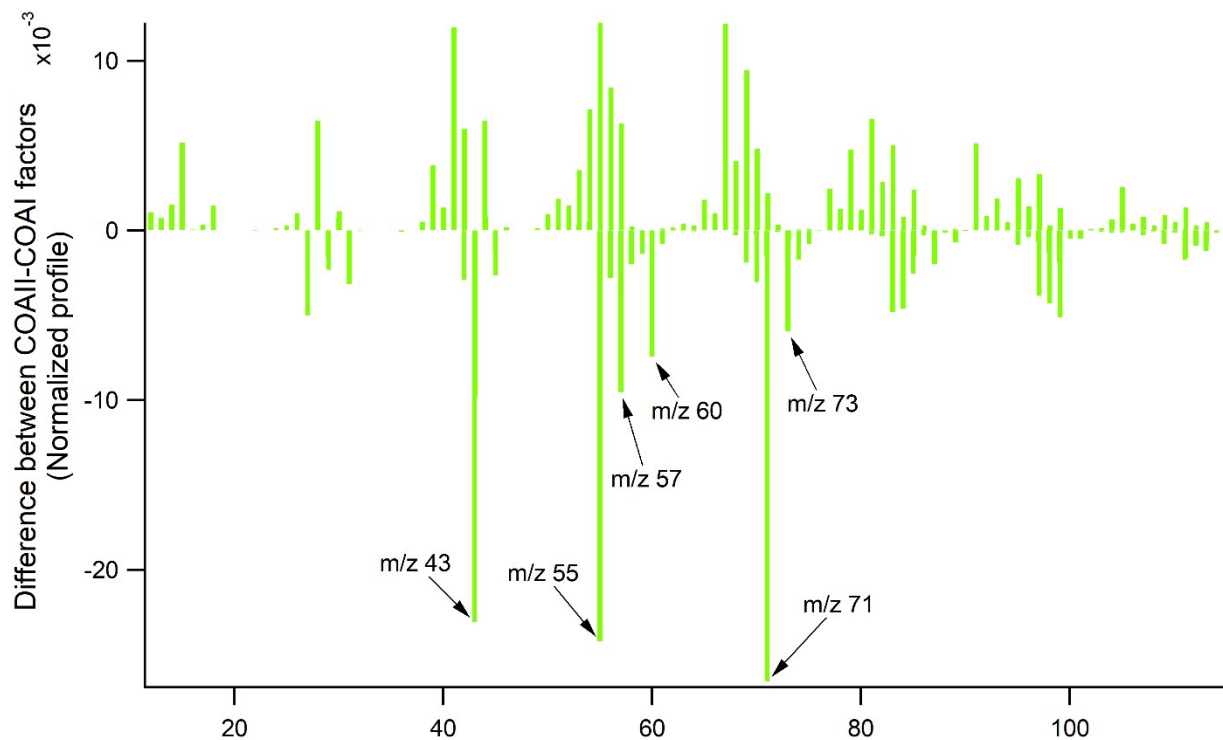
18

Figure S2. Mass spectra of glycerin from NIST database<sup>82</sup>

19 Figure S2 represents an organic mass spectrum of glycerin ( $C_3H_8O_3$ ) from NIST database.<sup>82</sup> Vegetable glycerine (VG) is one of the main constituent in e-cigarette, which is added as humectant  
 20 for vapour production from e-liquid.<sup>81</sup> The NIST laboratory spectrum of glycerin is similar to the mass spectra of vaping of e-cigarette mass spectrum measured in the residence.

21 **Mass spectra from cooking events.** By analysing specific m/z's from the average cooking mass spectrum using the PIKA software (not shown here), the organic mass spectrum was  
 22 estimated to consist of 98%  $C_3H_5$  at m/z 41; 80%  $C_3H_7$  and 20%  $C_2H_3O^+$  at m/z 43; 65%  $C_4H_7$  and 35%  $C_3H_3O^+$  at m/z 55; 80%  $C_4H_9$  and 18%  $C_3H_5O^+$  at m/z 57; 93%  $C_2H_4O_2$  at m/z 60; 90%  $C_3H_5O_2$  at  
 23 m/z 73. The largest identified peaks for cooking organic aerosols were the same as those identified by <sup>84, 85, 93</sup>. The major families of the AMS ion fragments were  $C_xH_y^+$ ,  $C_xH_yO^+$ , and  $C_xH_yO_z^+$   
 24 (Figure 4A). Overall, the relative intensity of the  $C_xH_y^+$  ion class out of the total organic signal during cooking activities was 74 %; for the  $C_xH_yO^+$  ion class was 20%; for the  $C_xH_yO_z^+$  ion family, it  
 25 was 6%.

26



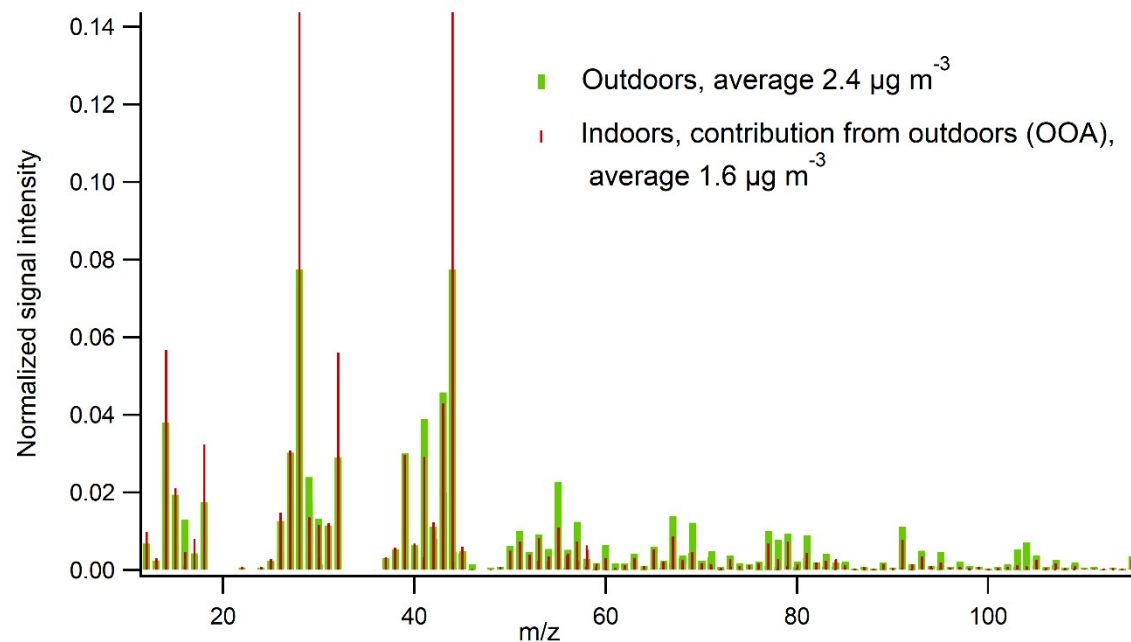
27

28

Fig. S3. Difference of the COAI and COAII factors retrieved from PMF results (COAII-COAI)

29 Figure S3 illustrates the differences of the COAI and COAII factors obtained from PMF results. Both COA factor profiles had characteristic peaks at m/z's 41, 43, 55, 57, 60, 71 and 73. However,  
 30 the main difference between two factors was that the intensity of m/z's 43, 55, 57, 60, 71 and 73 of COAI in comparison to COAII, in case of COAI they were less pronounced. The signals at m/z's  
 31 43, 55, 57, 71 represent unbranched-chain saturated hydrocarbons and long-chain fatty acids formed during cooking. The increased signals at m/z's 60 and 73 could appear due to specific type  
 32 of cooking during which degradation of complex sugars into single ring sugars took place. Due to the lack of information from the activity logbook, we were not able to attribute COAII factor to  
 33 specific type of food preparation.

34



35

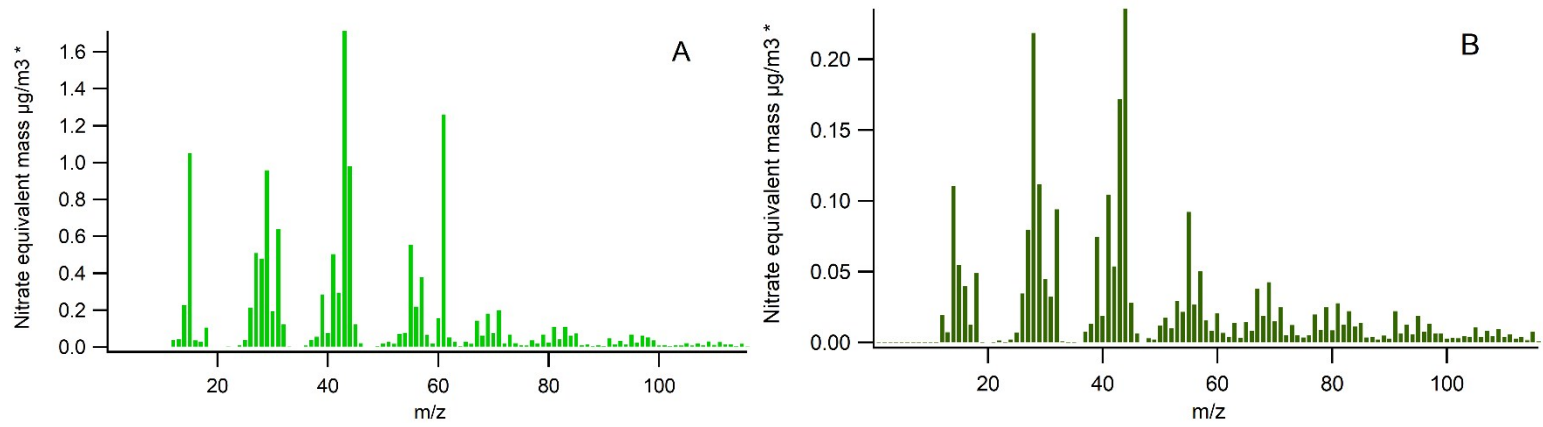
36

Fig. S4. Mass spectra outdoors and outdoor contribution factor (OOA)

37 Figure S4 shows the average outdoor mass spectra during the whole measurement campaign and mass spectra that represent outdoor contribution factor retrieved during PMF analysis. Both  
38 mass spectra show similar spectral pattern. It can be seen that not all the organic particle mass has penetrated inside (67 %) due to size dependent penetration through the building envelope.<sup>12</sup>  
39 Additionally, it can be seen that the main difference between the mass spectra is a higher fraction of m/z 44 (CO<sub>2</sub><sup>+</sup>). This is consistent with evaporation of more volatile species (which give a  
40 lower fraction of m/z 44). Furthermore, the time series is quite flat (see Figure 5B) which is consistent with penetration rather than with formation from highly variable precursor concentrations.  
41 For these three reasons (mass spectral pattern, concentration and time series), we consider it likely that factor is indeed mainly due to outdoor penetration. However, there could be some  
42 contribution due to indoor sources as well, e.g. secondary aerosol formation. Due to the uncertainties introduced by the penetration and evaporation, a mass closure is not feasible.

43

44



45

46

Figure S5. Average indoor (A) and outdoor (B) mass spectra

47

48

49

50

51

52