Supplementary Information

Molecular Insights into New Particle Formation in Barcelona, Spain

James Brean, David C.S. Beddows, Zongbo Shi, Brice Temime-Roussel, Nicolas Marchand, Xavier Querol, Andrés Alastuey, María Cruz Minguillón, and Roy M. Harrison

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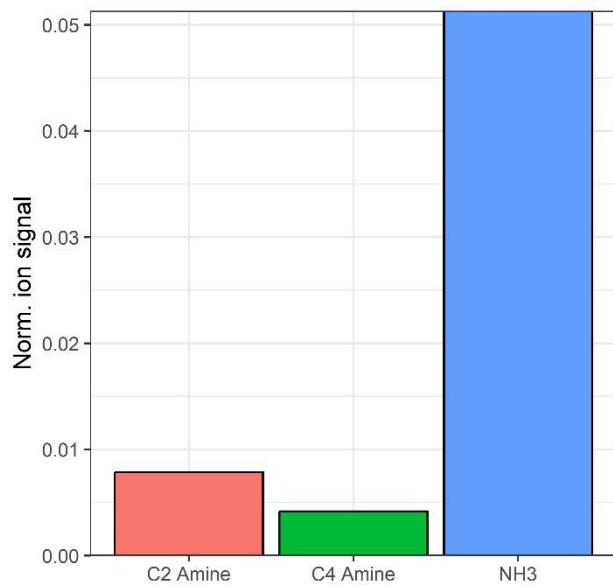
Figure S1: Mean ammonia and amine signals across the campaign as measured by CI-APi-ToF.
Units of normalised ion counts.

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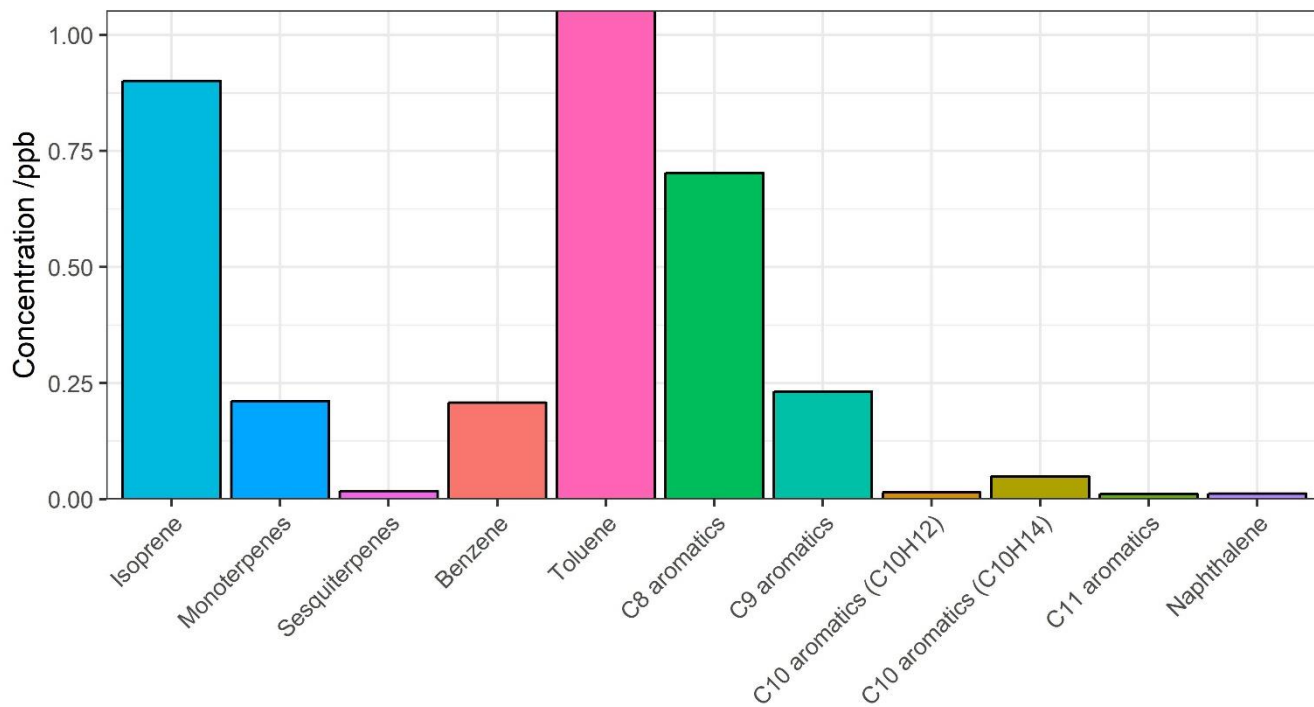
Figure S2: Mean selected VOC concentrations across the campaign as measured by PTR-ToF-MS.

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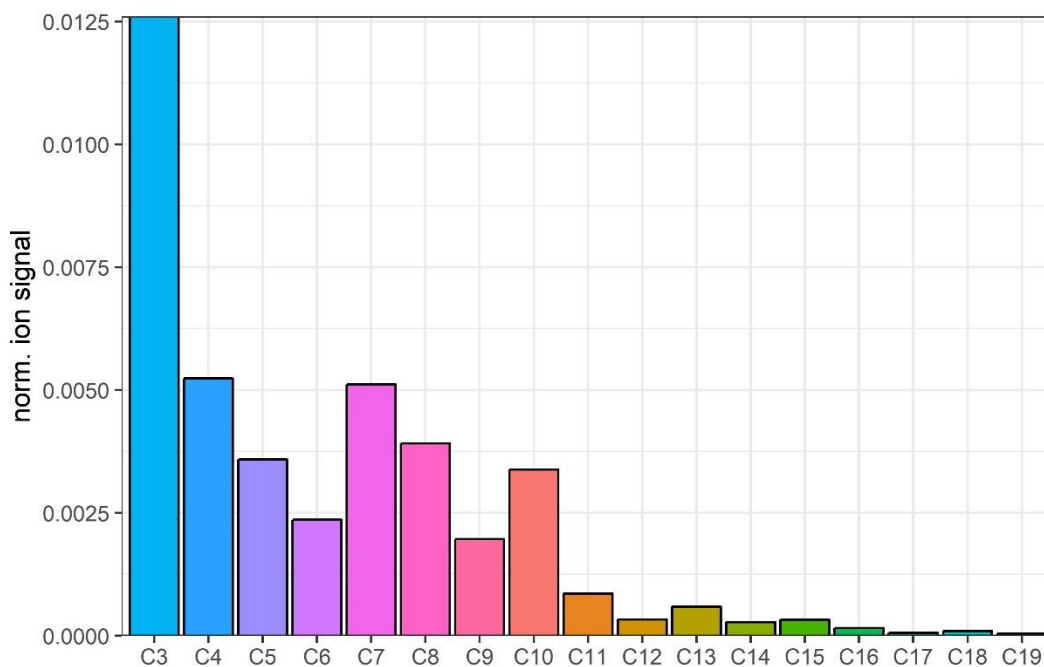
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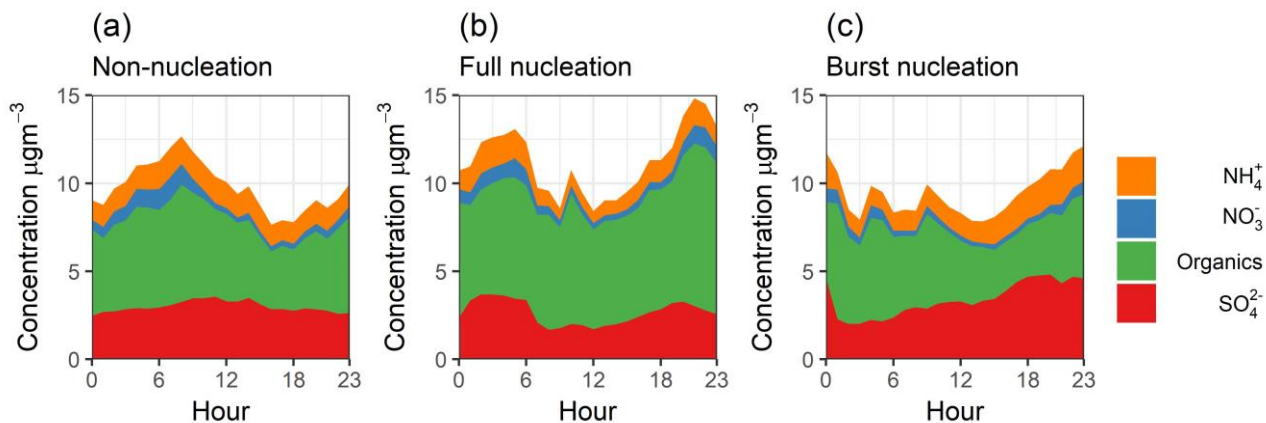
17 **Figure S3:** Mean ion signals per carbon number across the campaign as measured by CI-APi-ToF.
18 Units of normalised

19   ion counts.

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21 **Figure S4:** Average diurnals of particle composition as measured by ACSM on (a) non-nucleation,
22 (b) full-nucleation and (c) burst-nucleation days.

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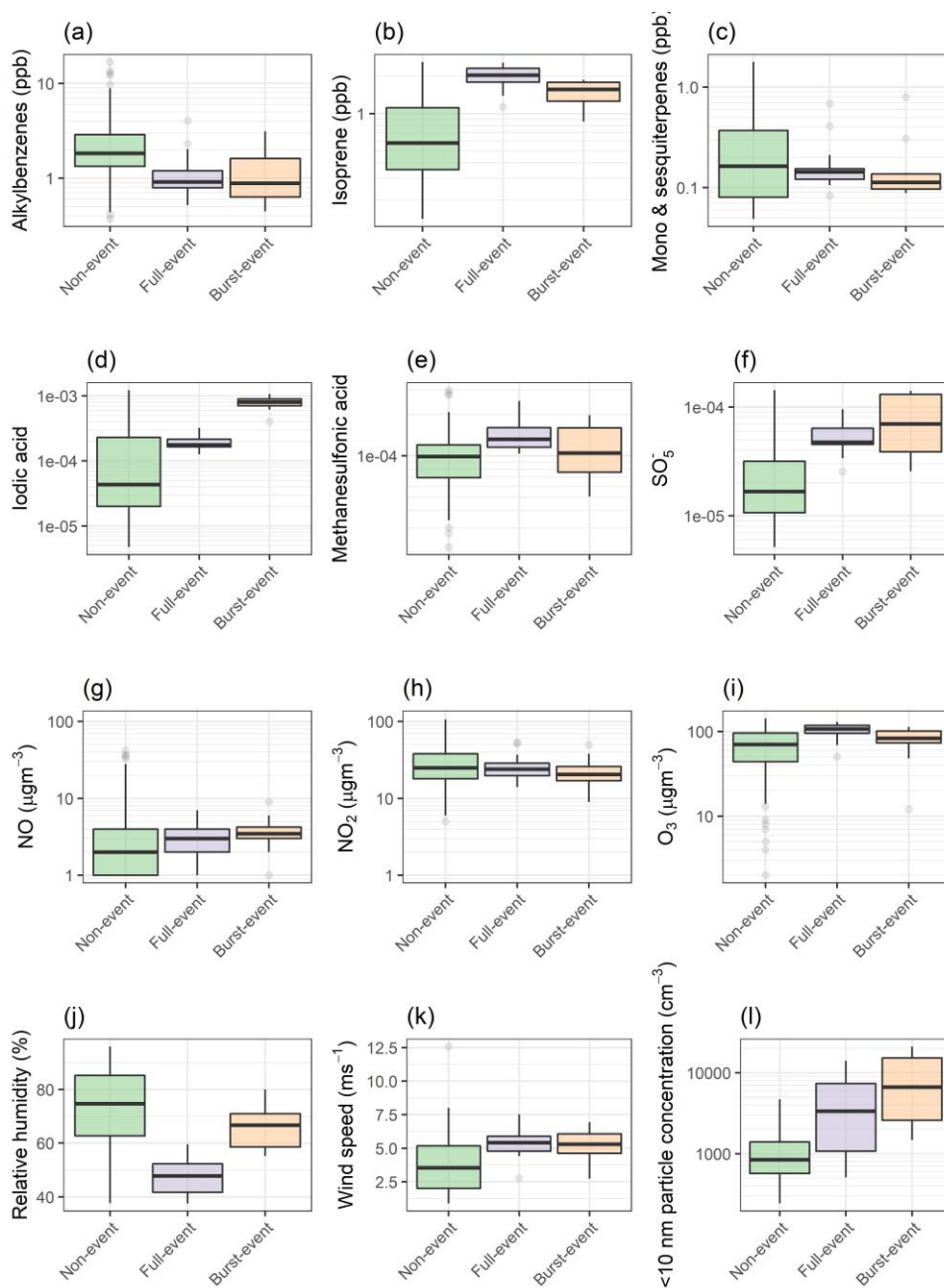
Figure S5: Box plots as figures 2 & 3 for (a-c) VOCs as measured by PTR-ToF-MS, (d-f) other
ions as measured by CI-APi-ToF (units of norm. counts) (g-i) trace gases, and (j-l) meteorological
and <10 nm particle count parameters.

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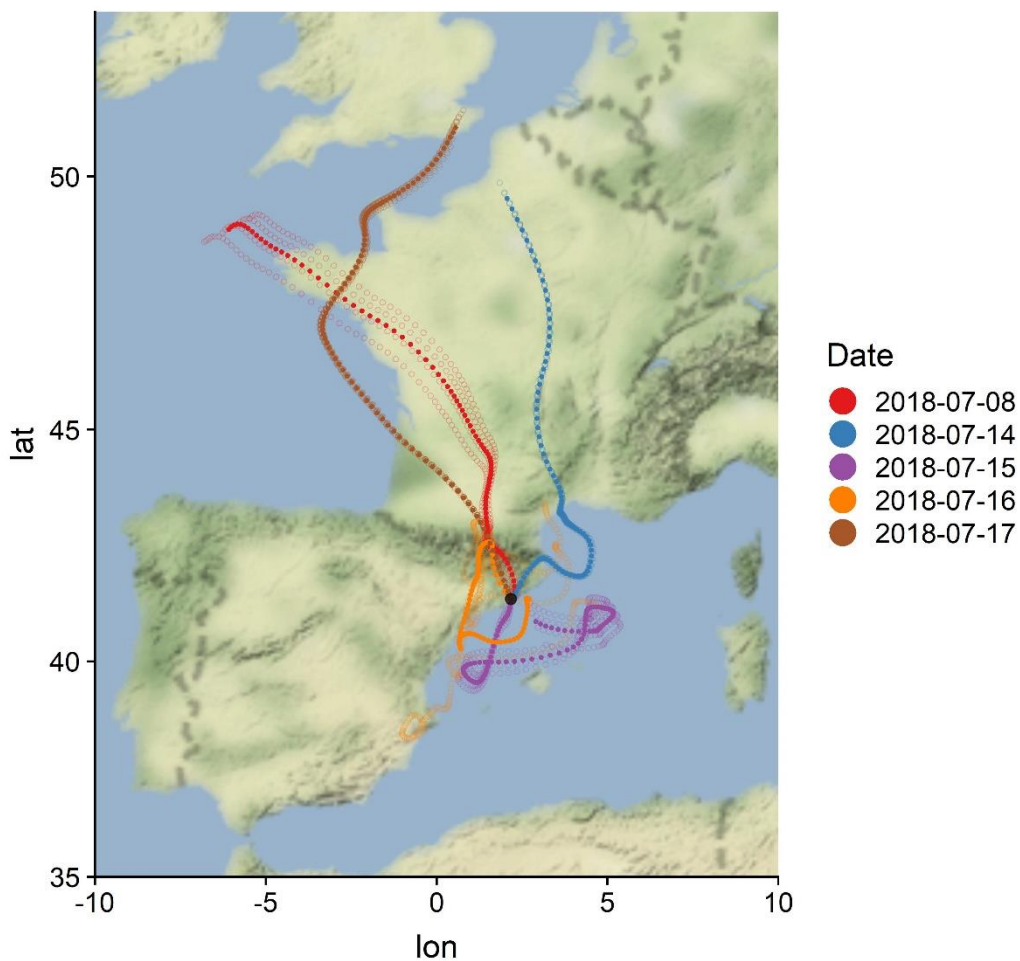
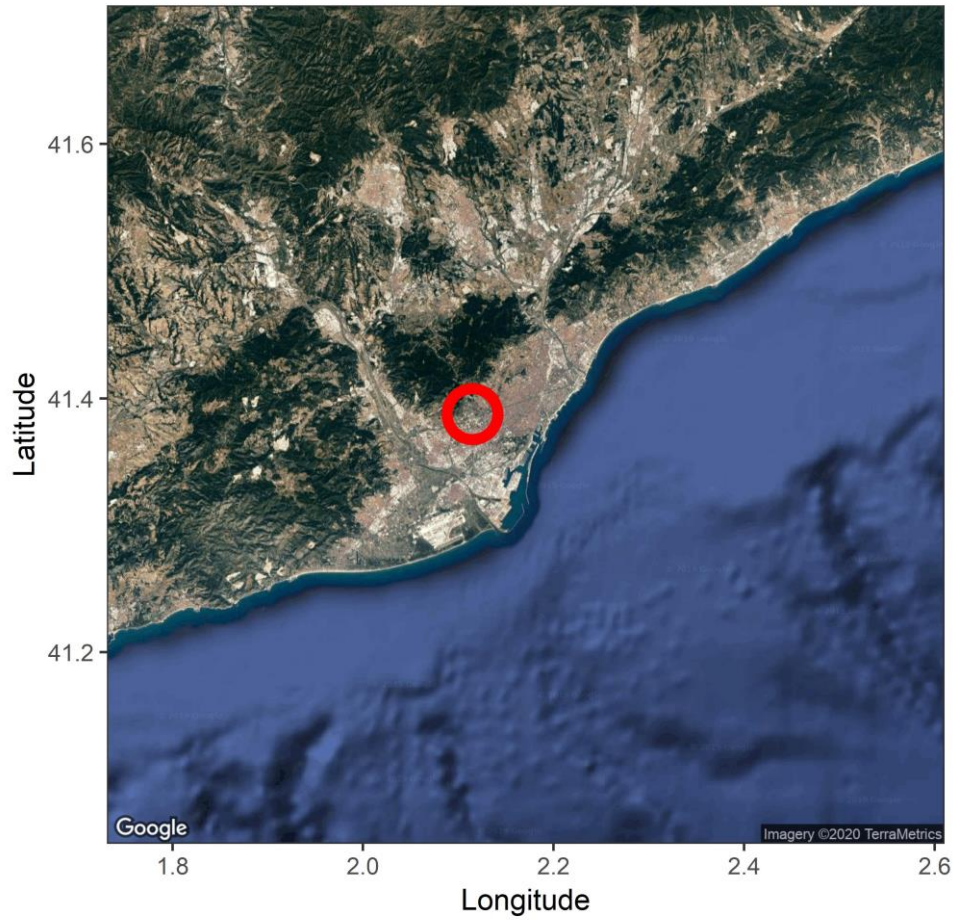


Figure S6: HYSPLIT 96 hour back trajectories per nucleation event. Dark dashed lines show mean
trajectory per event, light dashed lines show hourly trajectories from which mean is calculated.

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32 **Figure S7:** Location of sampling site.