



Supplement of

First insights into northern Africa high-altitude background aerosol chemical composition and source influences

Nabil Deabji et al.

Correspondence to: Hartmut Herrmann (herrmann@tropos.de)

The copyright of individual parts of the supplement might differ from the article licence.



Figure S1. Cluster analysis of back trajectories arriving at AMV site from August to December 2017 classified into 4 trajectory clusters.



Figure S2. Back trajectory calculated at 1267 m above ground level and 2000 m above sea level.



Figure S3. Frequency distribution and corresponding probability density function of PM₁₀ mass and wind speed during the sampling period.



Figure S4. (A) Typical background chemical composition average at AMV station (10 samples); (B) n-alkanes; (C) Polycyclic aromatic hydrocarbons (PAHs); (D) n-alkan-2-ones; identified compounds.



Figure S5. Correlation between OC and EC concentration at the AMV site according to each air mass; The black line represent the linear.

Figure S6. Correlation between anions and cations concentration (in equivalent); data corresponds to the concentrations measured at AMV for the study period.

Figure S7. Correlation between nss-SO₄²⁻ and nss-Ca²⁺ during Saharan dust (SD) air mass.

Figure S8. Average concentration of organic identified compounds at AMV station according to air masses for; (A) n-alkanes; (B) Polycyclic aromatic hydrocarbons (PAHs; (C) n-alkan-2-ones (PAHs); (D) sugars.

| | 20 | S | Na⁺ | Ŀ | NO ³⁻ | nss-SO4 ²⁻ | NH₄⁺ | c ₂ 04 ²⁻ | n-alkanes | nss-Mg ²⁺ | nss-K⁺ | nss-Ca ²⁺ | | | |
|---|------|------|------|------|------------------|-----------------------|------|---------------------------------|-----------|----------------------|--------|----------------------|---|------|----|
| ос | 1.00 | 0.50 | 0.63 | 0.38 | 0.67 | 0.73 | 0.54 | 0.88 | 0.88 | 0.73 | 0.61 | 0.72 | | | |
| EC | 0.50 | 1.00 | 0.40 | 0.07 | 0.51 | 0.44 | 0.49 | 0.52 | 0.50 | 0.39 | 0.60 | 0.14 | | 1 | .0 |
| Na⁺ | 0.63 | 0.40 | 1.00 | 0.76 | 0.77 | 0.67 | 0.45 | 0.74 | 0.52 | 0.37 | 0.25 | 0.32 | | | |
| CI | 0.38 | 0.07 | 0.76 | 1.00 | 0.46 | 0.34 | 0.13 | 0.39 | 0.32 | 0.18 | 0.13 | 0.25 | - | - 0. | .8 |
| NO ₃ - | 0.67 | 0.51 | 0.77 | 0.46 | 1.00 | 0.77 | 0.77 | 0.82 | 0.56 | 0.47 | 0.46 | 0.42 | | | |
| nss-SO42- | 0.73 | 0.44 | 0.67 | 0.34 | 0.77 | 1.00 | 0.79 | 0.84 | 0.64 | 0.62 | 0.51 | 0.60 | | - 0. | .6 |
| NH4 ⁺ | 0.54 | 0.49 | 0.45 | 0.13 | 0.77 | 0.79 | 1.00 | 0.65 | 0.49 | 0.33 | 0.36 | 0.26 | | - 0 | .4 |
| C ₂ O ₄ ²⁻ | 0.88 | 0.52 | 0.74 | 0.39 | 0.82 | 0.84 | 0.65 | 1.00 | 0.75 | 0.66 | 0.57 | 0.61 | | | |
| n-alkanes | 0.88 | 0.50 | 0.52 | 0.32 | 0.56 | 0.64 | 0.49 | 0.75 | 1.00 | 0.68 | 0.55 | 0.63 | - | - 0. | .2 |
| nss-Mg ²⁺ | 0.73 | 0.39 | 0.37 | 0.18 | 0.47 | 0.62 | 0.33 | 0.66 | 0.68 | 1.00 | 0.66 | 0.84 | | | |
| nss-K⁺ | 0.61 | 0.60 | 0.25 | 0.13 | 0.46 | 0.51 | 0.36 | 0.57 | 0.55 | 0.66 | 1.00 | 0.61 | | 0 | |
| nss-Ca ²⁺ | 0.72 | 0.14 | 0.32 | 0.25 | 0.42 | 0.60 | 0.26 | 0.61 | 0.63 | 0.84 | 0.61 | 1.00 | | | |

Figure S9. Correlation matrix plot for various compound and elements.

| | 20 | C ₂₃ H ₄₈ | C ₂₄ H50 | C ₂₅ H ₅₂ | C ₂₆ H ₅₄ | C ₂₇ H ₅₆ | C ₂ H ₆ | C ₃₁ H ₆₄ | C ₃ H ₆ | | |
|---------------------------------|------|---------------------------------|---------------------|---------------------------------|---------------------------------|---------------------------------|-------------------------------|---------------------------------|-------------------------------|---|-------|
| ос | 1.00 | 0.67 | 0.70 | 0.70 | 0.71 | 0.80 | 0.85 | 0.73 | 0.64 | | |
| C ₂₃ H ₄₈ | 0.67 | 1.00 | 0.94 | 0.86 | 0.59 | 0.64 | 0.55 | 0.24 | 0.36 | | 1.0 |
| C ₂₄ H ₅₀ | 0.70 | 0.94 | 1.00 | 0.96 | 0.72 | 0.76 | 0.62 | 0.32 | 0.36 | - | - 0.8 |
| C ₂₅ H ₅₂ | 0.70 | 0.86 | 0.96 | 1.00 | 0.75 | 0.83 | 0.70 | 0.45 | 0.33 | | 0.6 |
| C ₂₆ H ₅₄ | 0.71 | 0.59 | 0.72 | 0.75 | 1.00 | 0.89 | 0.77 | 0.67 | 0.59 | | 0.6 |
| C ₂₇ H ₅₆ | 0.80 | 0.64 | 0.76 | 0.83 | 0.89 | 1.00 | 0.93 | 0.77 | 0.82 | - | - 0.4 |
| C ₂₉ H ₆₀ | 0.85 | 0.55 | 0.62 | 0.70 | 0.77 | 0.93 | 1.00 | 0.87 | 0.90 | | 0.2 |
| C ₃₁ H ₆₄ | 0.73 | 0.24 | 0.32 | 0.45 | 0.67 | 0.77 | 0.87 | 1.00 | 0.93 | | |
| C ₃₃ H ₆₈ | 0.64 | 0.36 | 0.36 | 0.33 | 0.59 | 0.82 | 0.90 | 0.93 | 1.00 | | 0 |

Figure S10. Correlation between measured concentrations of OC and organic compounds.

Figure S12. Wind rose plot during day and night-time from August to December 2017 at AMV.