Size Distribution and Chemical Characteristic of Aerosols in Northwestern Black Sea Region of Turkey

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Size segregated PM samples were collected at the city center of Bolu, which is northwestern part of the Black Sea region of Turkey between 2015 and 2016. A cascade impactor was used for the collection of weekly PM samples on pre-fired quartz filters in eight different size ranges (9.0-10.0 μm, 5.8-9.0 μm, 4.7-5.8 μm, 3.3-4.7 μm, 2.1-3.3 μm, 1.1-2.1 μm, 0.65-1.1 μm, 0.43-0.65 μm). The collected samples were divided in three parts and each part was analyzed with different analytical technique. The first part of the filter was analyzed in terms of major ions (SO_4^{2-}, NO_3^-, Cl^-, NH_4^+, K^+, Ca^{2+}, Mg^{2+}, Na^+). A large suit of metals from Li to U were determined in the second fraction of the filter by means of ICPMS. Lastly, the third part of the filter was analyzed in terms of EC and OC. The preliminary results indicated that the PM mass depicted bimodal distribution and the average concentration of PM10 was about 100 μg/m3for a five week period. Both EC and OC showed bi-modal distribution while these two parameters were more enriched on smaller particles. The average concentrations of EC and OC in PM1 were determined as 4.1 and 40.6 μg/m3, respectively, indicating the secondary organic aerosol formation in Bolu ambient air. Among the major ions, SO_4^{2-} and NH_4^+ depicted unimodal distribution having significantly higher concentrations in fine particles (< 1 μm) while the rest of the ions present bimodal distribution. Mass closure analysis will be applied to the generated data set and sources will be evaluated by applying PMF.