Major sources of PM2.5 organic aerosols in Europe: Predominance of biomass burning and secondary organic aerosols (SOA)

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Based on a two-year aerosol study of the CARBOSOL project source apportionment of PM2.5 is performed seasonally for two rural and three mountain sites in Europe. The approach developed combines radiocarbon measurements with bulk elemental carbon/organic carbon (EC/OC) data and results of organic tracer analyses. A detailed uncertainty analysis has been conducted, which shows that the results do not depend much on the initial assumptions. It has been found that organic aerosols are largely made up of modern carbon throughout the year, but their sources are markedly different in summer and winter. In winter biomass burning primary emission is by far the most dominant source. Biomass burning mainly comprises domestic wood burning in winter, complemented with vast emissions from extensive agricultural fires in springtime. In contrast, in summer secondary organic aerosols (SOA) from non-fossil sources become predominant (63–76 % of TC). These findings corroborate other studies on rural aerosols which demonstrate the predominance of SOA in summer, and highlight the global importance of biogenic SOA in the troposphere.

Petrology and petrogenesis of the adakite-like intrusive rocks from the Bozüyük area, NW Turkey

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We have first recognized the Lower Cretaceous (125±4.2 M.A.; K-Ar) felsic intrusive rocks which were emplaced into the Triassic metamorphic rocks of the Sakarya continent as small stocks and dikes at the north of the Bozüyük town. The intrusive rocks are divided into the two subgroups: a) equigranular leuco tonalites and granodiorites, b) porphyritic equivalents of the formers. The second group is rare. They consist mainly of following mineral paragenesis: plg+qt+kfels±musc±allanite±pistasite± apatite ± rutile ±Fe-Ti oxides. They are peraluminous to metaluminous (ASI=1-1.28), and display low-K character. They have high amounts of SiO_2 (> wt % 70), Al_2O_3 (>15 wt %), Na_2O (5.62-7.16 wt %), low K_2O (0.77-1.23 wt %) and MgO (0.1-0.6 wt %). Low K_2O/Na_2O ratios (0.12-0.21), low Yb (0.17-0.38 ppm), Y (2.9-6.6 ppm), high Sr (146-634; av. 425 ppm) and Sr/Y ratios (28-45 in porphyritic serie; 113-196 in equigranular samples), and negative Nb-Ta anomalies. No negative Eu anomaly (Eu/Eu*= av. 0.98) is observed in the equigranular intrusive rocks. By contrast there is significant negative Eu anomaly (Eu/Eu*= av. 0.58) in the porphyritic group. The apparent impoverishment of HREE's, and negative Ti and P in PM-Normalized spidergrams indicates that presence of garnet, Fe-Ti oxides (i.e. rutile, ilmenite) in residual phase. The geochemical features outlined above indicate collectively that these intrusive rocks are closely similar to the adakite-like magmas (especially high silica adakites) and/or Arkeen TTG's [1–4]. Therefore, we conclude that our adakite-like intrusive rocks may possibly generated by oceanic slab melting during the Lower Cretaceous period. Presence of the coeval blueschists [5, 6] and an island-arc volcanic chain [7] within the neighboring areas support our view.

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