Properties of natural biogenic aerosols measured at the AMazonian Aerosol characteriZation Experiment (AMAZE-08)

PAULO ARTAXO[1], SCOT MARTIN[2], MEINRAT O. ANDREAE[3] AND THE AMAZE TEAM

[1]Institute of Physics, University of São Paulo, Rua do Matao, Travessa R, 187, CEP05508-090, Sao Paulo, Brazil (artaxo@if.usp.br)
[2]Harvard University, Cambridge MA, USA.
[3]Biogeochemistry Department, Max Planck Institute for Chemistry, Mainz, Germany

The main objectives of AMAZE-08 were to understand the sources and regulators of organic particle mass in a pristine continental environment and the connections between particle chemistry and particle optical and hygroscopic properties. The AMAZE-08 tower measurements were conducted during the wet reason. The site was 60 km NNW of Manaus and located within a mostly pristine rainforest. The site allowed the study of pristine biological aerosol particles, although there were several episodes of long-range transport from Europe and Africa and more infrequent regional transport from Manaus and northerly biomass burning. Particle instrumentation included two high-resolution aerosol mass spectrometers (HR-ToF-AMS) with thermodenuder, two cloud condensation nuclei counters (CCNC), a continuous flow diffusion chamber (CFDC) for ice nuclei measurements, three(OPC, an UV-APS for measurement of biologically active particles, two TEOMs, two SMPS, two multiwavelength nephelometers, three CPC, a MAAP, an aethalometer, coarse- and fine-mode filters for elemental and ion analysis as well as particle imaging. Gas instrumentation included a PTR-MS, and measurement of O_3, CO, CO_2, NO, and NO_x. Very low values of BC, light scattering, fine mode aerosol mass, and other properties were observed. The combination of this diversity of instruments allowed to observe the influence of sulphur in CCN activity, and to quantitatively apportion the effect of aerosol species on light scattering and absorption. Natural biogenic aerosol particles dominates more than 80% of aerosol mass and most of the observed optical activities. Secondary organic aerosol dominates the fine mode aerosol fraction.

Geochemical variations in the Erlend volcano, Faroe-Shetland channel

UNI ÁRTING[1] AND PAUL MARTIN HOLM[2]

[1]Jarðfeingi, Brekkutún 1, P.O. BOX 3059, FO-110 Tórshavn, Faroe Islands: (uni.arting@jardfeingi.fo)
[2]Institut for Geografi og Geologi, Øster Voldgade 10, 1350 København K, Denmark: (paulmh@geo.ku.dk)

Sr, Nd and Pb isotope ratios together with REE, other trace and major element measurments in the Paleogene Central Volcanic Complex, Erlend, situated in the Faroe-Shetland Channel evidence a complex petrological genesis. A detailed stratigraphic sampling of cores and cuttings in three exploration wells situated on this volcano have been investigated.

The volcano consists of mainly dacitic-rhyolitic extrusives with a basaltic lava sucession on top, interleaved with sedimentary units .

The basaltic lavas are divided into three destinct groups, based on trace element and isotope ratios. Two groups of low-Ti basalts and one high-Ti are recognized. The low-Ti basalt groups are distingusihed based on REE patterns and incompatiple trace element ratios. The low-Ti 1 group shows a MORB trend, with depleted LREE, whereas the low-Ti 2 group shows a flat LREE trace. The high-Ti basalt group has a strongly LREE enriched signature with La/Sm of 3.5 to 4.5.

New Sr, Nd and Pb isotopic data on these basalts show a wide range of ratios similar to basalts in continental settings. Crustal contamination is thus an important factor to consider in the interpretation of these. Most of the lavas show trends towards East Greenland and Scottish Archaean crustal values in $^{208}Pb/^{204}Pb$ and $^{206}Pb/^{204}Pb$ and $^{87}Sr/^{86}Sr$.

Trace element modelling of melting shows relatively high degree melting in the low-Ti 1 group ranging to lower degree in the low-Ti 2 group, and the smallest degree in the High-Ti group.

When data from the Erlend basalts are compared to those from the adjoining Faroe Island Basalt Group, it is evident that the Erlend basalts show several distinct features of the latest extrusive activity, the Enni formation and the latest dykes. This suggests that earlier correlations of the Erlend basalts to the earliest pre-breakup igneous activity are questionable. Furtheremore, the new data imply that the volcano situated in the Faroe-Shetland Channel was active after the breakup between the Faroe Islands and East Greenland.