Emerald mineralization at the Anuri prospect, Nunavut, Canada

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Emerald has been identified in 7 intervals from 3 drill holes at the Anuri Au and Ag prospect which is located ~410 km N of Rankin Inlet in Nunavut. The prospect is within the Committee Bay Greenstone Belt, which forms part of the Rae domain of the western Churchill province. The emerald occurs in rocks of the Neoarchean volcano-sedimentary Prince Albert Group, primarily in an altered komatiite with a texturally and mineralogically variable matrix of biotite, actinolite, plagioclase, pyrite and occasional quartz, calcite, and accessory minerals such as apatite, titanite, rutile, chalcopyrite and molybdenite. The emerald (and colorless beryl) can occur in quartz veins, at contacts, and potentially as a hydrothermal overprint. Electron probe microanalysis shows that the dominant chromophore is Cr (with essentially no V), with a maximum content of 2.62 wt% Cr_2O_3 or 0.20 Cr *pfu*. The emerald also contains unusually high concentrations of Na (maximum 2.66 wt.% Na_2O, or 0.49 Na *pfu*), Mg (to 3.41 wt.% MgO, or 0.48 Mg *pfu*), and Fe (up to 1.99 wt.% FeO, or 0.16 Fe *pfu*). The source of the Be is likely a nearby 2718 Ma tonalite [1] which intrudes the komatiites.

[1] Skulski *et al*. (2003) Geological Survey of Canada, Current Research **C22**.

Long range transport of volcanic aerosols: The Eyjafjallajökull plume 2010

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The plume of the Eyjafjallajökull 2010 and its transport into European airspace gave the possibility to study how the physico-chemical properties of a volcanic aerosol are affected by long-range transport. We compared the mineralogical composition and the morphology of particles of samples of resuspended ash collected in Iceland with samples taken from an airplane, which crossed the plume over the Dutch-German border and ground samples from the town of Freiburg im Breisgau and the Vosges Mountains. A clear change in mineralogy and morphology could be observed between airborne samples taken close to the volcano and after long range transport. The ground and airborne samples taken in and over Germany are impoverished in olivine, clinopyroxene and plagioclase phaenocrysts compared with Icelandic samples. The loss of these phaenocrysts is a consequence of the difference in density between the volcanic glass and the mafic crystals. The aspect ratio of the particles changes also during transport. Particles with high aspect ratio (>2.5) are almost absent in the plume over Europe. Possible explanation is the higher specific surface of such particles, which will enhance the tendency of aggregation. Average physical properties (melting point, hardness) of the plume particles relevant for air traffic security after prolonged transport are thus clearly different from the one close to the emission point. When assessing the societal and environmental impact of a volcanic plume these continuous physico-chemical changes will ultimately have to be taken into account.

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