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Mössbauer Spectroscopy of Samples from the 2010 Eyjafjallajökull Summit Eruption

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The 2010 Eyjafjallajökull summit eruption (Iceland) produced large amounts of fine ash, disturbing air traffic across the North-Atlantic and within Europe. Mössbauer spectroscopy of ash-samples and a lava-bomb has been performed to study the material properties and to gain insight into why the volcano produced so vast amounts of fine grained material.

Time series of ash samples reveal a changing ferric to ferrous ratio and level of crystallization which can be related to the different phases of the eruption. The lava bomb has a much lower ferric to ferrous ratio, implying that this relatively high ratio for the ash is a result of oxidizing phreatomagmatic steam explosions.