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地質学セミナー

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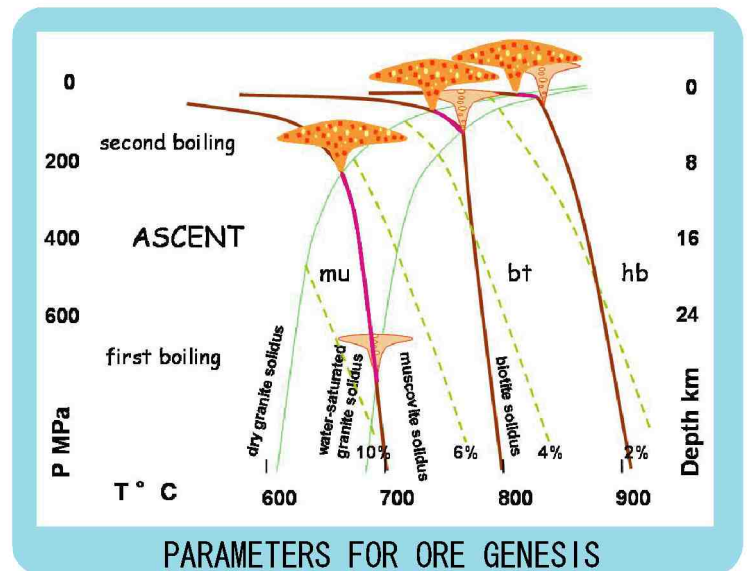
"Granites and ore generation" and "Rheology of two phase material"

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"Granites and ore generation"

The generation of granitic plutons is highly discontinuous, from its source to its emplacement, resulting in having a pluton built from successive magma inputs, with different temperature and composition.

The magma also includes an important fluid phase (H₂O, CO₂, S, halides, light elements as Li, Be, B) that is liberated during emplacement into the upper crust. The fluid phase also plays an important role in carrying many metals as complex compounds. Fluid exsolution occurs during the ascent, as first boiling, due to magma decompression. It is also takes place during crystallization, due to melt shrinkage, as second boiling. The effects of successive intrusions are examined in terms of sudden variations of the physical properties of the magma. Temperature contrast between mafic and felsic magmas induce changes in the diffusion characteristic length, partition coefficients and redox conditions of the magma and fluid phase. Those variations have been estimated and quantified when a mafic, or felsic, magma enters a felsic, or mafic, magma chamber.



"Rheology of two phase material"

The specific rheology of a melt into its matrix is examined in terms of instabilities development. They result from non-linear processes that develop during the segregation and the ascent of magma. Because two phases continuously coexist, namely the matrix and the melt, strain is highly partitioned between them. Thresholds control the change from a solid-like to liquid-like behaviour of the magma. In between those end-member behaviours, the rheology alternatively changes from one state to the other. Those factors induce highly discontinuous melt segregation, which needs both pure and simple shear to develop. Melt focusing is controlled by the viscosity contrast between the two phases. It gives place to different compaction lengths develop depending on the surrounding, a partially melting source or a nearly brittle crust. Owing to the discontinuous segregation process, intermediate magma chambers could develop with different temperature and magma composition. They could be the place of enhanced magma mixing.

次回のお知らせ

日時: 9月5日(水) 17時より

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