

Recrystallization and micro-inclusions in polar ice

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Ice is one of the oldest known and the most frequent mineral on the Earth's surface. Ice of polar ice sheets undergoes creep at low stresses and high homologous temperatures between 0.9 and 0.7. Under such circumstances recrystallization plays an enormous role in governing the state and thus the behaviour of the material. This has been recognized and interpreted in many ice cores in the last decades [1,2] assigning recrystallization regimes to ice sheet depth ranges. Grain boundary migration is a major process of recrystallization in ice and affects interpretation of climate records within the ice, in form of air bubbles, dust particles, salt micro-inclusions as solid or liquid phase because the accumulation and release of micro-inclusions at moving grain boundaries are always taking place from shallower depth until the bottom. This micro-inclusion loading could produce small grain size at the depth corresponding to high impurity concentration in ice sheets. We present the interaction between grain boundary of ice and micro-inclusions and its implication for polar ice-sheet dynamics.

[1]. Faria, S. H.; Weikusat, I. , Azuma, N. The Microstructure of Polar Ice. Part I: Highlights from ice core research. *Journal of Structural Geology* , **in press a**. [2]. Faria, S. H.; Weikusat, I. , Azuma, N. The Microstructure of Polar Ice. Part II: State of the Art *Journal of Structural Geology* , **in press b**.