



## **The Effects of Soluble Impurities on the Flow and Fabric of Polycrystalline Ice**

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It is well established that the Earth's large continental ice sheets contain a variety of naturally occurring physical impurities, both soluble and insoluble. Understanding how these impurities may affect the rheology, intrinsic thermodynamic properties, and ultimate fate of these ice sheets, however, is much less understood. One soluble impurity thought to be of critical importance and already shown to be catalytic in the flow of single crystal ice, is sulfuric acid. In order to further investigate the hypothesized effects that sulfuric acid may also have on the flow and ductility of polycrystalline ice, numerous polycrystalline ice specimens doped with known amounts of sulfuric acid have been prepared for mechanical testing in tension under a constant applied load but varying temperature. The influence of a variable temperature is thought to be of critical importance as other previous works have shown that the effects of temperature dependence on soluble impurities can be observed both in the ice crystal lattice and grain boundaries of the polycrystal. Thus far, our tentative results have shown a noticeable difference in the creep rates of the pure versus doped polycrystalline ice specimens. Furthermore, we expect that post-creep microstructural analysis via environmental SEM imaging, EBSP, and Raman spectroscopy will further solidify our working hypothesis.