Luminescence study on ice and salts for an analysis of salt inclusions in Antarctic ice core by optical luminescence

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Antarctic ice core, containing impurities like ions and dusts, has been investigated for a past climate change. Although ions like sulfate and nitrate in ice core have been measured by ion chromatography, they may not be suitable for an indicator of past climate and environment because they may diffuse in ice because of quite low eutectic temperature in acid form. Recently, Ohno et al. (2005) revealed that such ions remained as salts like sodium sulfate decahydrate (Na_2SO_4 $10H_2O$) in ice, suggesting that salt inclusion analysis in Antarctic ice core may be of great interest in palaeoclimatology. This analysis requires nondestructive method to identify salt of inclusions. In this study, we tested to use luminescence method, especially optical luminescence for detecting such salt inclusions in ice and will discuss whether this method is useful for salt inclusion analysis.