

Aggregation of Impurities on Ice: Spectroscopic Laboratory Study

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Anthropogenic as well as natural pollutants often accommodates in the cold regions in snow and ice. Their (photo)-chemical transformations may have important environmental consequences which are not yet fully understand. [1] Snow is a dynamic multiphase medium and changes in its structure affect physical and chemical processes occurring there. We conduct laboratory experiments aimed to enhance the understanding of the ice with impurities *via* absorption and fluorescence spectroscopies. The obtained results show that at freezing the compounds originally dissolved in the solution are concentrated between ice grains or form crystals at some conditions. [2] The freeze-concentration is studied using the energy transfer and the excimers since they both are enhanced at high concentrations on surface. [3]

[1] T. Bartels-Rausch, A review of air–ice chemical and physical interactions (AICI): liquids, quasi-liquids, and solids in snow, *Atmos. Chem. Phys.* **2014**, *14*, p. 1587 - 1633

[2] N. Takenaka, Acceleration Mechanism of Chemical Reaction by Freezing: The Reaction of Nitrous Acid with Dissolved Oxygen, *J. Phys. Chem.* **1996**, *100*, p. 13874-13884

[3] T. Yamanaka, Time-resolved fluorescence spectra of naphthalene doped in amorphous silica glasses, *CHEMICAL PHYSICS LETTERS* **1990**, *Volume 172*, number 5, p. 405 – 408