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The phenomenon of acidity and chemical compound of precipitation in central Arctic

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The abstract

The unusual precipitation fell at the Russian station North Pole-35 (81027 'N and 115019' E) from June to September 2007: in the global background concentrations of the main components the amount of ions was 1,1-3,6 mg/l, it was the increased amount of chloride in the presence of solid ice and deep urbanized micronutrients ─ the amount of heavy metals at the lowest total mineralization was 140 mg/l, that was about 13% of the minimum amount of ions. Maximum acidity was at the amount pH = 4.7.

Small frontal precipitation falls from stratus and stratocumulus clouds in the Arctic, more often than anywhere else. The presence of multilayer inversion structures creates the effect of constantly present polar haze. Aircraft icing is observed up to 4600 m according to pilots' records of 30-40s, that indicates a constant presence of supercooled droplets in the clouds. Supercooled droplets are actually distilled water.

The main transport of pollutants to the Arctic from the industrialized regions of Europe, Asia and North America is carried out in the winter season under the present system of air masses circulation. Mineralization of wet precipitation loss may reach 50 mg/l.

However, the phenomenon of increased content of micronutrients in precipitation observed in the relatively warm season, during the predominant transfer from the ocean to the land. Arctic clears the atmosphere from the main components and brings back the most toxic elements (and possibly radioactive elements).