

Sr-Nd isotopic ratios of mineral dust in Arctic snow

NAGATSUKA, Naoko^{1*} ; OGAWA, Yoshimi¹ ; GOTO-AZUMA, Kumiko¹ ; SUGIURA, Konosuke² ; ENOMOTO, Hiroyuki¹ ; YAMADA, Hironobu¹ ; NAKANO, Takanori³

¹NIPR, ²Toyama University, ³RIHN

Snow and ice on glaciers contain various atmospheric depositions, such as soot and mineral dusts. These light-absorbing impurities can reduce surface albedo and affect melting of glaciers. Thus, it is important to understand how these impurities were supplied on glaciers.

Stable isotopic ratios of Sr and Nd provide a means of identifying sources of substances and can use for the dusts in snow because it requires low samples for analysis. In this study, we analyzed Sr and Nd isotopic ratio of the mineral dusts collected from snow in several Arctic regions (Mongol, Alaska, and Greenland).

The Sr and Nd isotopic ratios of mineral dusts in Arctic snow showed geographical variations among the sampling sites. The ratios of dust collected from snow in Mongol showed higher Sr and lower Nd values, while those of Greenland were higher Sr and lower Nd values, and were close to the ratios that have been reported in loess, desert sand, soil, or moraine around each region. This result indicates that mineral dusts in snow on the two sampling sites were mainly derived from surrounding regions. On the other hand, the isotopic ratios of dust in snow of Alaska were close to those of deserts in Kazakhstan and Taklamakan Desert, suggesting that the mineral dusts originated from such further deserts were likely to be long-range transported to Alaska.

Keywords: Sr-Nd isotopic ratio, mineral dust in snow, Arctic region