

Iron in snow along the traverse route from Zhongshan Station to Dome A, East Antarctica

HONGMEI MA¹, GUITAO SHI¹, YUANSHENG LI¹,
MOTOHIRO HIRABAYASHI², HIDEAKI MOTOYAMA²

¹Polar Research Institute of China

²National Institute of Polar Research

Little information exists about iron concentration and spatial distribution characteristic in Antarctic snow. We present results of total iron analyses from surface snow samples collected along the traverse route from Zhongshan Station to Dome A, which is the summit of East Antarctic ice sheet during 2009-2010 Chinese National Antarctic Research Expedition (CHINARE). The determined Total Fe concentrations for all 120 of the surface snow samples ranged from 308.4 to 4896 ppt(ng L^{-1}). Based on the measurement value of snow accumulation rates, we calculated Fe deposition fluxes of 0.012-0.218 $\text{mg m}^{-2} \text{yr}^{-1}$. We also observed that Fe deposition fluxes along the traverse route are fairly evenly. Assuming our results to be broadly representative of atmospheric deposition over East Antarctic ice sheet, we use our mean estimates of atmospheric iron flux ($0.0577 \text{ mg m}^{-2} \text{yr}^{-1}$) to calculate annual Fe deposition flux over East Antarctic ice sheet of $8.07 \times 10^6 \text{kg}$.