# Fractionation of iron isotopes during estuarine mixing in Ob, Yenisey and Lena freshwater plumes

J. INGRI[1]*, J. GELTING[1], F. NORDBLAD[1], E. ENGSTRÖM[1,2], I. RODUSHKIN[2,1], P.S. ANDERSSON[3], D. PORCELLI[4], Ö. GUSTAFSSON[5], I. SEMILETOV[6] AND B. ÖHLANDER[1].

[1]Dep. Chem. Eng. Geosciences, Luleå Univ. Technol. Sweden, *Johan.Ingri@ltu.se
[2] ALS Laboratory Group, ALS Scandinavia AB, Luleå, Sweden
[3] Lab. Isotope Geol. (LIG), Swedish Museum Nat. History, Sweden
[4] Dep. Earth Sci., Oxford University, United Kingdom
[5] Dep. Appl. Environ. Science (ITM) Stockholm Univ. Sweden
[6] Inter. Arctic Res. Center (IARC), Univ. Alaska, Fairbanks, USA

Iron isotopes were measured in suspended matter (>0.2 µm) in the Ob, Yenisey and Lena River freshwater plumes during the International Siberian Shelf Study 2008 (ISSS-08). The $\delta^{56}$Fe value was around zero within the Lena River and close to the river mouth, but changed to more negative values in the outer parts of the plume. In both the Ob and Yenisey plumes suspended matter in the surface water had clearly negative values whereas samples close to the bottom showed values close to zero.

It has previously been suggested that total Fe in river suspended matter (>0.2µm) in boreal regions is roughly a mixture of three phases, detrital particles ($\delta^{56}$Fe around zero), oxyhydroxide particles ($\delta^{56}$Fe positive) and C-Fe particles ($\delta^{56}$Fe negative). We suggest that the $\delta^{56}$Fe pattern observed in this study is the result of relatively rapid removal of detrital particles and Fe-oxyhydroxides, leaving a suspended fraction with negative values in the surface water in the outer parts of the freshwater plumes. Hence, during estuarine mixing of suspended particles heavy iron isotopes are deposited close to the river mouth, whereas light isotopes are exported to open ocean water.

# Nitrogen isotopes in volcanic fluids of different geodynamic settings

S. INGUAGGIATO[1]*, Y. TARAN[2], T. FRIDRIKSSON[3], G. MELIÁN[4] AND W. D'ALESSANDRO[1]

[1]INGV Palermo, Via Ugo La Malfa, 153 Palermo Italy (*correspondence: s.inguaggiato@pa.ingv.it)
[2]Instituto de Geofisica UNAM Coyacan Mexico D.F.04510 Mexico (taran@geofisica..unam.mx)
[3]Iceland GeoSurvey grensasvegur 9, 108 Reykjavik (Thrainn.Fridriksson@isor.is)
[4]ITER, 38611, Granadilla, S/C de Tenerife, Spain (gladys@iter.es)

Nitrogen isotopes , $N_2/^{36}$Ar and $^3$He/$^4$He were measured in volcanic fluids within different geodynamic settings. Subduction zones are represented by Aeolian archipelago, Mexican volcanic belt and Hellenic arc, spreading zones – by Socorro island in Mexico and Iceland and hot spots by Iceland and Islands of Cabo Verde. The $\delta^{15}$N values, corrected for air contamination of volcanic fluids, discharged from Vulcano Island (Italy), highlighted the presence of heavy nitrogen (around +4.3 ±0.5‰). Similar $\delta^{15}$N values (around +5‰), have been measured for the fluids collected in the Jalisco Block, that is a geologically and tectonically complex forearc zone of the northwestern Mexico [1]. Positive values ($\delta^{15}$N around +3‰) have been also measured in the volcanic fluids discharged from Nysiros island located in the Ellenic Arc characterized by subduction processes. All uncorrected data for the Socorro island are in the range of -1 to -2‰. The results of raw nitrogen isotope data of Iceland samples reveal more negative isotope composition (about -4.4‰). On the basis of the non-atmospheric $N_2$ fraction (around 50%) the corrected data of $\delta^{15}$N for Iceland are around -16‰, very close to the values proposed by [2]. In a volcanic gas sample from Fogo volcano (Cabo Verde islands) we found a very negative value: -9.9‰ and -15‰ for raw and corrected values, respectively.

[1] Inguaggiato *et al*., (2004) *G*$^3$, **5**, Q12003. [2] Mohapatra *et al*. (2004) *G*$^3$, **5**, Q01001.