



Normal variations in the isotopic composition of metabolically relevant transition metals in human blood

L. Van Heghe (1), C. Cloquet (2), and F. Vanhaecke (1)

(1) Department of Analytical Chemistry, Ghent University, Krijgslaan 281-S12, 9000 Ghent, Belgium
(iana.vanheghe@ugent.be), (2) CRPG/CNRS, BP 20, 54501, Vandoeuvre-Nancy, France

Cu, Fe and Zn are transition metals with great catalytic, structural and regulating importance in the human body. Hence, an aberrant metabolism of these elements can have serious implications on the health of a person. It is assumed that, due to differences in isotope fractionation, the isotopic composition of these elements in whole blood of patients can be different from that in blood of healthy subjects. Therefore, isotopic analysis of the element affected by the disease can be a promising approach for early diagnosis.

A method for isotopic analysis of Cu, Fe and Zn in human whole blood was developed. The simultaneous chromatographic isolation of these elements and the conditions for isotope ratio measurement via multi-collector ICP – mass spectrometry (MC-ICP-MS) were optimized.

So far, only whole blood of supposedly healthy volunteers (reference population) was analyzed. Results for Fe confirmed the known differences in isotopic composition between male and female blood. It is also shown that other parameters can have influence as well, e.g., the isotopic composition of Zn seems to be governed by the diet.