



Towards a black carbon inventory of Swiss surface water sediments

A. Sobek and T.D. Bucheli

Agroscope Reckenholz-Tänikon Research Station ART, Zürich, Switzerland
(thomas.bucheli@art.admin.ch / Fax: +41 44 377 72 01 / Phone: +41 44 377 73 42)

Pyrogenic carbon particles such as soot and charcoal (collectively termed black carbon; BC) are ubiquitously present in sediments and soils and appear to explain fractions of strongly sorbed hydrophobic contaminants, thus having implications for the fate, availability and toxicity of these compounds. Hence, knowing the BC content in environmental matrices is of great importance for the understanding of the fate and thus risk of many xenobiotic contaminants. The aim of the present study was to contribute with a first inventory of the BC content in Swiss lake and running water sediments, in order to create a basis for future risk assessments of various contaminants in these water bodies.

In total around 200 sediments, collected during the last 15 years, were analyzed for BC content. These sediments represent 36 lakes and 26 rivers or streams. The majority of the lakes or rivers were sampled once, while some locations, e.g., the Bodensee have a higher resolution of samples. The data set also enables analysis of changes over time, since several dated sediment cores were collected. The BC content was determined using the chemothermal oxidation method (CTO-375), which was evaluated by analysis of the 12 BC Ring Trial standards before any samples were analyzed.

The median BC:TOC ratio for all surface sediments (ca 0-3 cm; not including sediment cores) was 2.9 %, with a quartile range of 1.9 - 4.3 %, thus lower than the previously reported median value of 9 % for around 300 different locations around the world. However some locations, such as the rivers Ticino and Rhone, displayed BC contents above 10%. The BC:TOC ratio was generally similar in the running waters and lakes (median_{rivers} 3.2%, median_{lakes} 2.7%). The sampled sediments represent highly various water bodies in many aspects, enabling a discussion of the impact of

these parameters. The data set will thus be further discussed and evaluated taking into account e.g., lake volume-to-surface-area ratio, climate, altitude, catchment area and land use.