

CHLORINE-36 INTERLABORATORY COMPARISON

Can we harmonize ^{36}Cl data on a world-wide scale?

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As a first step towards using world-wide a common ^{36}Cl standard-type material for the normalization of ^{36}Cl AMS results, we have initiated an interlaboratory comparison, but with differences in the execution of the project compared to other round-robin exercises: a) participants have given up anonymity to better optimize discussion and conclusions, b) preliminary results have been shown at various scientific meetings and workshops to discuss first trends and to increase the number of participants, c) participants had the possibility to repeat their AMS measurements and/or change measurement setups or data evaluation to improve individual data [e.g. 1]. We are aware and acknowledge that these later changes by some of the participants, which led to different overall data compared with the initial results, are not fully consistent with the idea of a normal proficiency test layout. However, these data changes were accepted to better meet the main objectives of the intercomparison: to identify and eliminate differences between AMS laboratories, thus, improving the ^{36}Cl data quality world-wide as soon as possible.

The evaluation of the final results of the eight participating AMS laboratories for three synthetic AgCl samples with $^{36}\text{Cl}/\text{Cl}$ ratios at the 10^{-11} (SM-CI-11), 10^{-12} (SM-CI-12), and 10^{-13} (SM-CI-13) level shows no difference in the sense of simple statistical significance [2]. However, more detailed statistical analyses indicate a certain interlaboratory bias and an underestimation of uncertainties by some of the laboratories. The round-robin data demonstrate that $^{36}\text{Cl}/\text{Cl}$ results from two individual AMS laboratories can differ by up to 17% (Fig. 1). Thus, the necessity for further work on harmonizing the ^{36}Cl business on a world-wide scale and on improving the measurements is obvious.

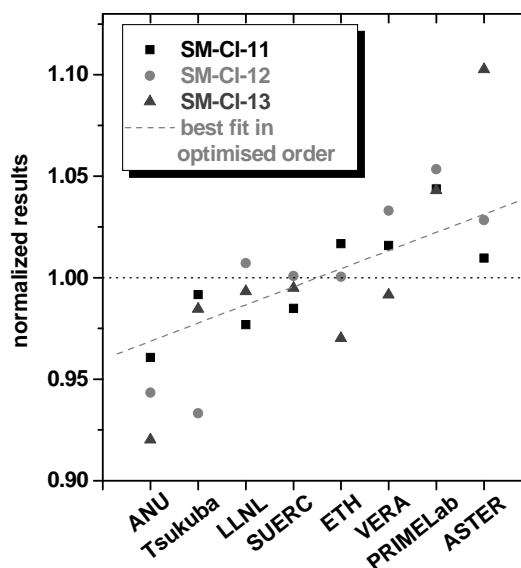


Fig. 1: Regression of normalized results for the three investigated samples in the order of ascending average.

- [1] V. Alfimov et al., Ion Beam Physics Annual Report (2009) 13
 [2] S. Merchel et al., Anal. Bioanal. Chem., submitted

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