

During the execution of the proficiency test iis07A05 on perspiration of heavy metals in textile, the results for chromium as reported by the group in this proficiency test appeared to be divided bimodally. This phenomenon may be explained by the use of various liquor ratios by the participating laboratories as one can see in table 1.

<u>Liquor Ratio used</u>	<u>10 : 1</u>	<u>20 : 1</u>	<u>50 : 1</u>
n(umber of labs)	11	11	16
mean (n)	14.51	24.41	37.67
st.dev. (n)	1.493	5.303	5.581
R(calc.)	4.18	14.85	15.63

Table 1: Evaluation of the results by liquor ratio for the determination of Chromium

The effect of the liquor ratio on the test results is significant. When the liquor ratio is increased, significantly more Chromium is found. The same is found for Lead and Arsenic.

It should be noticed that for the results reported in this proficiency test, all participants have performed the acid perspiration step according to almost the same conditions, although small differences in sample intake and perspiration time and temperature may still be of influence. However, the liquor ratio (mls of perspiration liquid / grams of textile sample) appears to be a parameter of utmost importance for the determination of Chromium and Lead and also, but less, Arsenic. For Nickel no correlation between the liquor ratio and the measured Nickel concentration was observed.

Without mentioning this ratio (or the respective test method), the test results for Chromium and Lead may have little value. It is therefore remarkable that many laboratories that reported to have used the test method ISO105 or OKO-TEX200 (which refers to ISO105) did not use the liquor ratio 50/1 as prescribed in ISO105, but used a deviating liquor ratio, thus affecting the analytical test results for chromium, arsenic and lead.

Together with the final report, a questionnaire was sent to the participating laboratories. They were asked for their opinion on the necessary action to be taken for the next proficiency test. In total 68 questionnaires were sent out. A high response was received. After one month 20 (=29%) completed questionnaires had been returned.

The opinions of the participating laboratories on this subject are rather scattered:

10 laboratories prefer to have one liquor ratio prescribed in the next PT

5 laboratories prefer to have requested to perform the tests with 2 prescribed liquor ratios

4 laboratories prefer to leave the choice of liquor ratio to the participant.

One laboratory remarked that soon a new standard will become in force in Germany that prescribes a liquor ratio of 1:50 for the respiration of heavy metals.