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Determination of Selenomethionine in Selenized Yeast Supplements

Production and consumption of Se supplements have increased dramatically in recent years as yeast-based supplements have emerged as an acknowledged means of alleviating selenium nutrient deficiencies for both animals and humans. However, it is evident from earlier studies that these supplements are often inconsistent in their makeup relative to label indications.

Significant efforts have been made in the development of analytical methods for the speciation of Se in yeast in recent years [selenomethionine (SeMet) is the dominant Se species in yeast-based Se supplements]. Extraction procedures used are of paramount importance for the accurate determination of SeMet in yeast

or other solid samples, and numerous ones have been developed. However, there remains a lack of consensus regarding whether there are forms of selenium other than SeMet in yeast. Consequently, the four major industrial companies producing selenized yeast boast their SeMet content as a proof of the quality of their yeast without a consensus existing on the methodology used and the validity of the measurements supplied.

The purpose of this project is to examine existing methodologies

published in peer-reviewed journals and issue recommendations on the determination of this extremely important nutritional supplement. The task group is composed of five scientists with considerable experience in the field, and the work will be carried out in close collaboration with the potential stakeholders.

For more information, contact Task Group Chairman Zoltan Mester <zoltan.mester@nrc.ca>, Canadian national representative to the IUPAC Analytical Chemistry Division, Institute for National Measurement Standards National Research Council, Ottawa, ON, K1A 0R6, Canada.



www.iupac.org/projects/2005/2005-041-2-500.html



*Illustration depicts a 3D model of the yeast enolase protein, showing three areas of selenomethionine incorporation (red dots). Image reproduced by permission of Zoltan Mester and The Royal Society of Chemistry from *The Analyst*, 2005, 130, (1), cover page © Crown Copyright of Canada.*

Selection and Use of Proficiency Testing Schemes for Limited Number of Participants (Chemical Analytical Laboratories)

The IUPAC Interdivisional Working Party on Harmonization of Quality Assurance has recently revised the international harmonized protocol for the proficiency testing (PT) of (chemical) analytical laboratories. The IUPAC Technical Report was published in *PAC* 78(1), 145-196, 2006.

However, PT schemes described in the protocol were developed mostly for a relatively large number of laboratories-participants (more than 20 to 30). These laboratories form a representative statistical sample from the corresponding theoretical population of an infinite number of participants. Even if analytical results of the laboratories-participants are distributed arbitrarily, the sample mean distribution is close to the normal one. Therefore, the assigned/certified value of the PT test material can be calculated from the PT participant results as a consensus value [i.e., as the mean (or the median) of the results]. The performance of these participants is assessed based on the difference between their results and the assigned value.

The problem is that even for 30 participants, their (statistical) sample mean and standard deviation differ significantly from the corresponding population characteristics. For fewer than 30 participants, the difference between the sample and the population values is increasing with decreasing the number of participants, especially dramatically when it is less than 20.

Moreover, if the size of the population of laboratories is not infinite, and the size of the statistical sample is more than 5 to 10 percent of the population size, the ratio between the sample and the population sizes should be taken into account. In addition, not only are the sample mean or median of laboratory results biased in general from assigned/certified value (to be traceable to SI units), the population mean and median can be biased as well.

Thus, selection and use of a PT scheme for a limited number of participants (less than 20 to 30) are not routine tasks. Such schemes are quite often required for analysis of materials and/or for environmental analysis specific for a local region, for an industry under development, for analysis of unstable analytes, for a local laboratory accreditation body to control the performance of numerous unaccredited laboratories,

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and so forth. Therefore, the aim of the project is to develop guidelines that could be helpful for PT providers and accreditation bodies in solving this task.

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 www.iupac.org/projects/2005/2005-019-2-500.html

Young Ambassadors for Chemistry in Korea

As Korea celebrates 2006 as the Year of Chemistry, the Korean Chemical Society hosted a Young Ambassadors for Chemistry (YAC) workshop in Gwangju in the southern part of South Korea. The event took place from 20–24 February 2006 at the Chonnam National University in Gwangju.

YACs is a project of the Committee on Chemistry Education (CCE) and the Science Across the World program; its aim is to increase the public's understanding of chemistry using young people to mediate between chemistry and the general public. The students (age 10–18) perform chemistry-related activities at public locations and explain what they are doing to the passers-by, who are usually unable to keep away from the interesting



The line of cosmetics developed by the students.

hubbub they witness taking place among the group of children. The event in Gwangju was the fourth YAC event, following on the heels of others held over the past two years in Taipei, Taiwan; Buenos Aires, Argentina; and Krasnoyarsk, Russia.

Train the Trainers

Prof. Choon Do, the Korean representative to CCE, organized and hosted the event and translated all event materials into Korean (the materials are downloadable from the Science Across the World Website <www.scienceacross.org> for all Korean teachers).

The event included a four-day training program for

middle-school science teachers, high-school chemistry teachers, and English teachers from around the region, as well as guests from Taiwan and Japan. The English teachers played an invaluable role at the event, stepping in to help interpret when we couldn't make ourselves understood and helping create a truly collaborative, multilingual experience.



Production of the cosmetics.

On Monday, teachers carried out activities from the Science Across the World topics “Chemistry in our Lives” and “Talking about Genetics around the World”—including counting the number of taste buds on each others' tongues and surveying variation in their own group in the classroom.

On Tuesday, we carried out a “Post-It” debate on the issue of genetic science. At the same time, the teachers discussed the chemical “products” that students would produce and the advertisements for them they would prepare.

Colleagues were invited to subscribe to the Science Across the World program and join more than 5 000 teachers in some 120 countries in exchanging cultural

Students perform television commercials for the cosmetics.

