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Technical Protocol

Proficiency Testing Scheme Lot N C80370

1. General Information

The procedure for interlaboratory comparisons includes organizing, conducting and evaluating of the subject of PT (product or material) at preliminary established conditions under an approved Invitation and Registration card.

The main purpose of the PT Scheme is to make a competent and responsible evaluation of the real laboratory testing capabilities based on interlaboratory comparison according to the requirements and the criteria of EN ISO/IEC 17043:

- Evaluation of laboratory performance in the specific testing;
- Establishment of the effectiveness and comparability of testing and evaluation methods.
- Establishment of the equivalence and comparability of testing results.

2. Organization and conducting of PT Scheme

1. Organization

(Information for the PT organizer)

ASPL at CPAchem Ltd, Bulgaria, 6006 Stara Zagora, 21 Blvd Patriarh Evtimiy

Accredited PT provider, accreditation certificate № AP-2024, ANSI-ASQ National Accreditation Board

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Note: When the Participant in a PT scheme promulgates the current report, they are obliged to provide its whole content, not parts of it.

2. Participants and participation criteria

Allowed to participate in the PT Scheme are laboratories accredited as per ISO/IEC 17025 and other applicable standards, Laboratories developing quality management system according to the requirements of ISO/IEC 17025, Laboratories with proven practical experience and also such who wish to get a competent evaluation for their performance in connection with law application legislation; satisfying the requirements of regulatory bodies and clients.

Depending on the PT Scheme targets in some cases the participation criteria can be stricter.

3. Characteristics, the subject of PT and range of quantity

Measurand	Range	Measurement units
Total Hardness	1 - 20	meq/l
pH	5.0 – 10.0	-
Total Solids at 105 C	100 - 10000	mg/l
Conductivity	100 - 2000	μS/cm
Residual Free Chlorine	0.1-1.0	mg/l

4. PT Scheme conduct

Participants registration and confirmation by ASPL – deadline 25.02.2016

Delivery, preparation, splitting, quality control of material (when applicable), testing/ homogeneity and stability analysis, outgoing control (if applicable) – deadline 16.03.2016.

Sending PT samples, together with participants' identification codes – deadline 07.03.2016.

Analysis of participants' samples and reporting their results by PT Coordinator – deadline 25.03.2016.

Analysis of obtained results and evaluation of Laboratories' performance, evaluated with appropriate statistical methods – deadline 04.04.2016.

Completion of the final report and sending to participants – deadline 08.04.2016



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5. Transport to participants

Samples, subject to PT are sent in proper packaging and as per terms, guaranteeing the integrity of material during transportation. After the material is delivered, CPAChem does not take any responsibility if the material was not handed to the respective specialist or if it wasn't stored as per the recommended conditions. Participants are obliged to check the contents of the shipment in the moment of delivery and contact the PT Coordinator in case of any problems connected with material's condition or the accompanying documents. If the package was received damaged, the participant should send a picture, if possible. If a return of the PT sample is necessary, the participant shall receive instructions.

Notes:

- 1. Participants are required to inform the PT organizer if the sample was not received or if it was received damaged, according to the time schedule.*
- 2. In case of proven damage or sample contamination, ASPL shall send a new sample.*

6. Confidentiality

The Anonymity of participants is guaranteed as a unique identification code is generated for every participant, which is known only to the PT Coordinator. The results from testing/measurement are presented only via the received identification code.

In case anonymity is compromised, new codes shall be generated for participants. In some schemes, participants can agree their anonymity to be disclosed, but this can happen only with their acquaintance and full permission. In extreme cases, when information about conducted PT Schemes is required by authorized bodies, the participant will be informed in written form.

7. Safety precautions for prevention of unauthorized agreements between participants and actions in case such are found out

The goal of the PT Scheme will be compromised if participants don't provide results, obtained by them. In order to prevent agreement between participants, the assigned values are kept in secret until the report of PT is published. If there is a clear evidence for provision of fake results, participants will be notified. In any case, it's the PT scheme participants' responsibility to behave professionally.

3. Sample, subject to PT Scheme

Object of comparison

Drinking water



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Material preparation

Samples are prepared in the clean laboratory premises of ASPL. After conducting homogeneity and stability tests, until they are sent to the participants in the PT Scheme, the samples are kept in the specific sector in their original packaging.

Information for methods used for sample preparation and testing

There are no specific requirements about used methods. The routine methods of the participant shall be used.

1 Homogeneity and stability testing procedures.

Homogeneity and stability tests are performed by following the procedure, described in ISO/IEC 13528: Statistical methods for use in Proficiency Testing by Interlaboratory Comparisons.

2 Assigned property values of PT Sample and their uncertainty. Applicable statistical methods.

When processing the results, connected with homogeneity and stability, assigning value of the PT sample characteristics and also processing PT scheme participants' results, common statistical methods shall be used according to the recommendation of ISO 13528, Technical report of IUPAC „The International harmonized protocol for the Proficiency testing of Analytical Chemistry Laboratories”, ISO Guide 35, ISO-GUM, or other appropriate methods which are statistically valid and fully described by ASPL.

The assigned property values and their uncertainties of the PT Scheme Lot N C80370 will be obtained from PT scheme participants' results or part of them after removing the outliers as per preliminary defined criteria for value processing as per WQP 5.19.1.1. After the outliers are removed the assigned value is defined as a consensus one on the base of robust statistics - robust average value and robust standard deviation via median value (according to the IUPAC Technical report of The International harmonized protocol for the Proficiency testing of Analytical Chemistry Laboratories).

3 Information about metrological traceability of the assigned property value

The participants shall provide information about the used certified reference materials or other ways for ensuring metrological traceability. The detailed reference shall be present in the PT Scheme report.

4. Evaluation of PT Scheme results

1. Evaluation criteria of participants' performance

The following criteria are applied in PT Schemes organized by ASPL:

$$z\text{-score, } z = \frac{x_{lab} - x_{ref}}{s}$$

where: s is the standard deviation, obtained from results of the participating laboratories;
 x_{lab} - participant's result; x_{ref} - assigned value for the certain PT Scheme.

If the uncertainty of the assigned property value is higher than the standard deviation multiplied by 3, it is taken into account and z is calculated as per the following formula:

$$z' = \frac{x_{lab} - x_{ref}}{\sqrt{s^2 + u_{ref}^2}}$$

" ζ -zeta" criteria

$$zeta = \frac{x_{lab} - X_{ref}}{\sqrt{u_{lab}^2 + u_{ref}^2}}$$

where: x_{lab} - participant's result; x_{ref} - assigned value for the certain PT Scheme; u_{lab} - combined standard uncertainty of participant's result; u_{ref} - standard combined uncertainty of assigned value.

2. Evaluation of participant's performance

If $|z, \zeta| \leq 2,0$: results are satisfactory

If $2,0 < |z, \zeta| < 3,0$: results are questionable

При $|z, \zeta| > 3$: results are unsatisfactory

3. Standard deviation of PT results (y);

Standard deviation of PT Scheme results is evaluated by calculation of average square deviation. If some results are clearly distinguishing, they shall be removed as per commonly accepted criteria.

Considering the calculated standard deviation, the completion of the homogeneity and stability criteria according ISO 13528 shall be evaluated.



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5. PT participants' results and evaluation

1. Provision of PT participants' result

It is recommended that the results and calculations are checked thoroughly by participants before they are reported. The results shall be reported clearly, in the form and measurement units, described in the Invitation for participation in proficiency testing (PT). The participant reports only the ending results. Usually zero results and those below the range for finding the method shall not be reported.

When the participant uses various methods for analysis, they can present more results. Those results will be included in the statistical analysis. This allows comparison of results, obtained from different participants via various methods.

When environmental conditions have influence on the quality of results, they shall be reported.

If required by ASPL for the needs of the PT Scheme, participants shall provide information about the used certified reference materials, proof for competence of the manufacturer of RMs, etc.

Results are presented on an electronic and paper copy, as they are identified as per the participant's code only.

Presenting of results and uncertainty

It is recommended that participants report results with associated uncertainty. The reporting form of results is as per Application 1 (Excel File).

2. Evaluation of the presented results

After processing the results they will be presented in a table and graphic view as they will also be evaluated as per the announced evaluation criteria.