



**CSIR-National Environmental Engineering Research Institute
Proficiency Testing Programme**

(Code: PT-Trace metals-NEERI/2016)

**Cadmium, Chromium, Copper, Iron, Lead, Manganese, Nickel, Zinc in
aqueous solution**

ORGANIZED BY

CSIR-National Environmental Engineering Research Institute (NEERI)

Nehru Marg, Nagpur- 440020

August, 2016

Coordinated by CSIR-NEERI in cooperation with PTB-Germany

Contact:

Dr. Rita S. Dhodapkar

Coordinator, (PT-Trace metals-NEERI/2016)

Senior Technical Officer (3)

Wastewater Technology Division

CSIR-National Environmental Engineering Research Institute

Nehru Marg, Nagpur-440020

Tel. (O): 0712-2249885-88 & 2249970-72; FAX (O): 0712-2249900

Email: rs_dhodapkar@neeri.res.in



CSIR-NEERI Proficiency Testing Programme
(PT-Trace metals-NEERI/2016)
Measurement of Cd, Cr, Cu, Fe, Pb, Mn, Ni, and Zn
in aqueous solution



Call for participation

Proficiency testing scheme for measurement of Cd, Cr, Cu, Fe, Pb, Mn, Ni, and Zn in aqueous solution
(PT-Trace metals-NEERI/2016)

Dear Colleagues,

You are cordially invited to participate in the proficiency testing scheme on the **measurement of Cd, Cr, Cu, Fe, Pb, Mn, Ni, and Zn in aqueous medium**. This proficiency testing scheme is being organized by CSIR- National Environmental Engineering Research Institute (NEERI), Nagpur. The objective of the inter-laboratory/ proficiency testing scheme is to provide opportunity to testing & calibration laboratories to establish their competency in the measurements of Cd, Cr, Cu, Fe, Pb, Mn, Ni and Zn in aqueous medium and hence for their quality assurance and to generate reliable data. It is being done in association with PTB-Germany

Time schedule for the proficiency testing programme is shown as follows.

Time schedule	Phase
1 st August 2016	Call for participation
16 th August 2016	Deadline for registration
20 th September 2016	Sample distribution
20 th October 2016	Deadline for submission of results
10 th November 2016	Draft Report for comments
30 th November 2016	Final report to participants

If you are interested to participate in the above proficiency testing scheme, please complete the Registration Form as per Annex. II and return it by email to the CSIR-NEERI coordinator Dr. Rita S. Dhodapkar (rs_dhodapkar@neeri.res.in) on or before **16th August, 2016**. Your support and participation in the proficiency testing programme (PT-Trace metal-NEERI/2016) will be highly appreciated.

Best regards,

Dr Rita S. Dhodapkar

Coordinator, (PT-Trace metal-NEERI/2016)

Senior Technical Officer (3), WWT Division, CSIR-NEERI, Nagpur



CSIR-NEERI Proficiency Testing Programme
(PT-Trace metal-NEERI/2016)
**Measurement of Al, Cd, Cr, Cu, Fe, Pb, Mn, Ni, V
and Zn in aqueous solution**



Registration Form

Institution/Laboratory:

Postal address:

Contact person

Title

Given name

Surname

E-mail/ Tel.(Off./Mb):

Participation fees: Nil

Confirmation of Participation

I, on behalf of my laboratory, would like to participate in the proficiency testing programme (PT-Trace metal-NEERI/2016) on the measurement of Cd, Cr, Cu, Fe, Pb, Mn, Ni, and Zn as ASTM/ IS/ ISO methods. Please send the sample to the postal address.

Print Name/ Desig./ Signature:

Date:

Please complete this form and return it to the CSIR-NEERI coordinator of the proficiency testing programme (E-mail: rs_dhodapkar@neeri.res.in) on or before 16th August 2016.

Contact Person:

Dr. Rita S. Dhodapkar

Coordinator, (PT-Trace metals-NEERI/2016)

Senior Technical Officer (3)

Wastewater Technology Division

CSIR-National Environmental Engineering Research Institute,

Nehru Marg, Nagpur-440020

Tel. (O): 0712-2249885-88 & 2249970-72; FAX (O): 0712-2249900

Email: rs_dhodapkar@neeri.res.in

1. **Technical Information regarding Cadmium, Chromium, Copper, Iron, Lead, Manganese, Nickel and Zinc determination in aqueous solution**

2. Analyte results to be reported in the following format

Analyte	Dates of analysis	Method used (ASTM / IS)	Concentrations (mg L ⁻¹)			Mean (mg L ⁻¹)	Combined Standard Uncertainty (mg L ⁻¹)	Expended Uncertainty (95% confidence)	Whether Accredited for the test (Yes/ No)
			I	II	III				
Cd									
Cr									
Cu									
Fe									
Pb									
Mn									
Ni									
Zn									

3. **Technical Information of Methodology Used** (Please answer the following questions in separate sheets)

- i) Which std. **method** has been adopted for determination of Cd, Cr, Cu, Fe, Pb, Mn, Ni and Zn, whether IS, ASTM or ISO
- ii) Which **instruments** were used to determine Cd, Cr, Cu, Fe, Pb, Mn, Ni and Zn, (make, manufacturer, model etc)?
- iii) Indicate your **calibration standards** (source, traceability, associated uncertainty, CRM used etc.).

- iv) State the **quantification method** used (e.g. external calibration, standard addition etc.). If internal standard was used, please specify.
- v) What was/ were the **measurement equation(s)** used to calculate the Cd, Cr, Cu, Fe, Pb, Mn, Ni and Zn concentration of analytes. Please provide details of all the factors found in the equations and uncertainty measurement and indicate how these values were determined.
- vi) How were the uncertainties on each factor estimated? Give a complete description of how the estimates were obtained and combined to calculate the overall uncertainty. Please prepare a table detailing the **full uncertainty budget**.
- vii) Any **additional information** apart from the above?

Signature/

Print name/

Designation:

Date:



CSIR-NEERI Proficiency Testing Programme

(PT-Trace metal-NEERI/2016)

Measurement of Al, Cd, Cr, Cu, Fe, Pb, Mn, Ni, V and Zn in aqueous solution



Instructions to participants

I. PROFILE

I. I PREAMBLE

Contamination of toxic metals in water is due to both natural as well as anthropogenic ways. The toxic elements easily enter into the human body mainly through water and their excess ingestion causes many diseases to human being. The concentration of these toxic elements are being routinely analyzed by testing laboratories. Reliable analytical results are required for compliance with international regulations in almost all areas of analysis. Therefore, a proficiency testing (PT) on the toxic metal ions such as arsenic and fluoride is being organized by CSIR-NEERI. The main purpose of this proficiency-testing program is to evaluate the performance/ measurement capability of participant laboratories in toxic elements in water. The PT scheme will be implemented as per ISO 17043:2010. **The total number of PT participants is restricted to about fifty and preference will be given to EPA approved/ NABL's ISO-17025 accredited testing labs.**

I. II BACKGROUND

CSIR–National Environmental Engineering Research Institute is the pioneering institute in Environmental research and monitoring. Within the Metrology in chemistry project : ‘Strengthening the Quality infrastructure in environmental analytics: Cooperation on Environmental Measurement in India (CEMI)’, in technical collaboration with PTB, Germany, this PT scheme is going to be conducted for the testing of Cadmium, Chromium, Copper, Iron, Lead, Manganese, Nickel and Zinc in aqueous solution and is supported by CEMI and PTB Germany for SI traceability dissemination. **No participation fee is being charged for this PT.**

II TECHNICAL DETAILS

II.I PT SAMPLE

The PT sample will be multi-elemental aqueous solutions prepared gravimetrically using high purity CRM/Metal. Adequate amount of supra pure acid has been added in aqueous solution for its stability. The elemental reference value of the PT sample will be the gravimetric value, duly cross checked through validation with suitable sophisticated equipment. Homogeneity of the aqueous elemental PT samples will be ensured from the validation results of randomly selected PT bottles. The stability checking will be carried out in a specific time period interval until the completion of PT scheme and its storage.

II.I.I Each participating laboratory will receive one number of sample of aqueous elemental solutions as per the following details for measurement of their concentration
Cadmium, Chromium, Copper, Iron, Lead, Manganese, Nickel and Zinc [0.005 to 2 mg/L]

II.I.II Upon receipt of sample, participating laboratories should carefully inspect the sample for any leakage or physical damage.

II.I.III It is recommended to store the samples in a secure environment below room temperature ($< 25^{\circ}\text{C}$) before use. Analysis however has to be performed only after the sample is brought to the room temperature.

II.I.IV It is advised that the participating laboratories treat proficiency test sample in the same manner as majority of routinely tested sample.

II.II TESTING OF SAMPLE

II.II.I Samples could be analyzed directly i.e. without any treatment. In case, if dilution of the sample is needed, utmost care should be taken for dilution of the elemental solutions. To prevent contamination from internal and external surface, all the glass/ plastic/ Teflon wares to be used in preparation and storage of diluted sample and calibration standard solutions should be cleaned. Use of calibrated glassware and suitable diluting medium for dilution of the samples is strongly advised and to be mentioned the dilution procedure.

II.II.II Laboratories should use standard test method for water analysis preferably for which they are accredited for example APHA, ASTM, IS, ISO etc.

II.II.III During measurement, participants should take care of working environment to avoid contamination and close the sample bottle after withdrawing the solution to prevent the evaporation. Analysis should be done on three different days to check the reproducibility.

II.II.IV Testing should commence as soon as possible after receiving the sample.

II.III REPORTING OF RESULTS

II.III.I Each element should be analyzed in triplicate each day and report the concentration values up to second decimal place i.e. **XX.XX** in the unit of mg kg^{-1} or $\mu\text{g g}^{-1}$ along with the value of **Measurement Uncertainty with 95% confidence level**. The results with technical info asked should be reported in the **RESULT SHEETS** supplied format with the samples only.

II.III.II In case your laboratory does not carry out any of the determinations/ measurements for a test parameter, please indicate by a cross (X) in the appropriate box on the Result Sheet.

II.III.III Results should be reported **not later than 20th October 2016** as specified in the Report Sheet. Kindly send the filled Report Sheet by Speed Post/ Courier to the address given at the end of this protocol and the result can be intimated through email with all documents attached.

II.III.IV After completion of measurements, participating laboratories are required to send the technical info/ documents along with test report to CSIR-NEERI:

- ❖ Computer generated Calibration Curves
- ❖ Raw Data

II.IV STATEMENT OF CONFIDENTIALITY

All the PT participating laboratories will be allocated with the code number, after the receipt of result sheet by NEERI to ensure confidentiality of the laboratories and results. A final PT report will be issued at the end of program.

II.V FEEDBACK

All the participating laboratories will be individually conveyed the status of their performance, with remarks.

III REGISTRATION FOR PARTICIPATION AND TIME LINE

The interested laboratory having appropriate facilities for analysis of Cadmium, Chromium, Copper, Iron, Lead, Manganese, Nickel and Zinc can register in the prescribed form (Annex II) duly filled by sending to CSIR-NEERI, for participation in the PT scheme. The last date for registration in the PT scheme is **16th August 2016**. The test samples would be dispatched to participants by **20th September 2016**. The last date for submission of results is **20th October 2016**. The draft report for comments would be by **10th November 2016** and the PT program final report is scheduled to be completed by **30th November 2016**.

IV PARTICIPATION FEE: Nil

V GENERAL INFORMATION:

For any queries, please contact to the PT Coordinator Dr. Rita S. Dhodapkar.

Contact Details of PT Coordinator

Dr. Rita S. Dhodapkar

Coordinator, (PT-Trace metals-NEERI/2016)

Senior Technical Officer (3)

Wastewater Technology Division

CSIR-National Environmental Engineering Research Institute,

Nehru Marg, Nagpur-440020

Tel. (O): 0712-2249885-88 & 2249970-72; FAX (O): 0712-2249900

Email: rs_dhodapkar@neeri.res.in