



PROFICIENCY TEST PLAN FOR IRON ORE 2021

ACCREDITATION

ITAK – Instituto de Tecnologia August Kekulé is an ABNT NBR ISO / IEC 17043 Proficiency Testing provider accredited by “Coordenação Geral de Acreditação do Inmetro (Cgcre)”, for the following PT's: Iron Ore, Gold Ore, Copper Ore and Concentrates, Nickel Ore, Silver and Niobium Iron Alloy. Our aim is providing continuous improvement practices in performing chemical analyzes worldwide to our customers.

The project is going to continue and in 2021, **ITAK** is going to promote five (5) rounds of **Proficiency Test Program for Iron Ore Analyzes** and invites the laboratories of such market to join the group of participants.

BENEFITS

Besides an impartial tool of assessment laboratory performance, the participation in proficiency tests has several benefits, such as:

- ✓ Adherence to one of the requirements of ISO / IEC 17025 for companies already Accredited, or searching to accreditation on this ISO standard or other quality systems;
- ✓ Increased metrological reliability of the results obtained by the laboratory from their levels of precision and accuracy;
- ✓ Comparison with other industry laboratories and finding improvement opportunities to increase performance level (benchmarking);
- ✓ The opportunity of evaluation and comparison of methodologies seeking one that best suits the level of accuracy required for specific parameters and levels;
- ✓ Awareness on the type of deviations that may be done by the laboratory (systematic or random) guiding actions to eliminate/minimize them;
- ✓ Identify staff training needs; and/or normalization or improvement of analytical methods.

ADDITIONAL BENEFIT: CERTIFICATION OF MATRIX FROM THE PARTICIPANT

ITAK is recognized worldwide as a manufacturer and supplier of Certified Reference Materials (CRM) of various geochemical matrices. As an additional benefit to participants of this Proficiency Test, laboratories may submit materials from their routine in order ITAK can prepare Reference Materials and include them as Test Items in the rounds of this PT. The participant must keep in touch to define the material collection criteria, shipping, amount and characteristics of the samples to be sent. ITAK will be responsible for homogenization, chemical analysis and homogeneity assessment to approve its using in the PT. This benefit is free of costs.

Attention: The cost and fees related to the raw material and CRM shipping will be the customer's responsibility.

This benefit is limited to the first 8 participants subscribed.

At the end of the Round in which Reference Material (RM) is used, it will be certified becoming a CRM and the donor will receive a number of aliquots previously announced.

All participating laboratories must be aware that their reported results may be used by ITAK in the certification of reference materials used in the PT as test items, preserving the data confidentiality.

CONFIDENTIALITY

According to a confidentiality protocol adopted by ITAK, the labs are identified by specific numerical codes, and the participant knowledge and access only to their own code, avoiding collusion among participants, which in case of occurrence or suspicion, it will be properly investigated and handled by the program coordination team.

The performance comments described in the final reports are also confidential and intended to provide important information to the person in charge of the laboratories so that they have a thorough evaluation of the quality aspects of their analysis and know where to act effectively to correct possible deviations.

The experimental results obtained by the Participant Laboratory or even their performance in the Proficiency Test may be disclosed to third parties with the consent of the Participant Laboratory.

STATISTICAL TREATMENT

For this Proficiency Test, it is required a group of participants greater than 6 (six) laboratories.

The results obtained by the participants are evaluated according to methodologies and statistical tools referenced by the ISO standards.

According to the results for accuracy assessments, the participating laboratory can be classified as proficient (satisfactory performance) for the analysis of a specific parameter, or not proficient if its performance is unsatisfactory or questionable.

Each used statistical technique has its use limited and conditioned to the number of participants who reports numerically valid results and approved in the Evaluation and Treatment Outliers.

SAMPLES AND ANALYSES

In 2021, ITAK will launch five (05) rounds of Proficiency Test Program for Iron Ore Analyses, each one consisting of 10 samples referring to two reference materials of different concentrations (05 sachets containing 8 g each), totaling 10 sachets per round.

The samples will be sent by the ITAK from João Monlevade / MG, under the guidance of the Participant Laboratory, using an appropriate way to transport.

The samples are Reference Materials (RM) with proven homogeneity and stability. RM's are produced by ITAK following the ABNT NBR ISO 9001: 2015 Quality Management System and ISO quality protocols

(ISO Series Guide 30 to 35) and ABNT NBR ISO 17034 - General requirements for competence of reference materials producers.

It is the participant's responsibility to follow up and clarify the shipment through customs or carrier when it is required. If samples come back to ITAK because of incorrect address information or because the laboratory has not clarified the shipment through customs, ITAK can charge reshipping expenses.

Test items can be shipped by using customer account on FedEx, DHL, and UPS carriers.

Along with the samples will also follow instructions directing the Participating Laboratory on how to treat the samples, carry out the analyzes and report the analytical results.

Any communication about this Proficiency Testing, such as doubts, reporting of results, technical reports, and certificates of participation, is by software available at www.itak.com.br/app for participating laboratories.

In addition to their test results and methodologies, ITAK PT participants should also report the measurement uncertainties of each analyzed parameter (if available). It has to be sent as the Standard Uncertainty Combined, without application of any coverage factor, which would make it Expanded Uncertainty. Such data should be reported in specific fields in the ITAK PT Management System.

Invalid analytical results such as "less than" or "zero" are not amenable to statistical evaluation. Therefore, in these situations, ITAK will not do the participant performance evaluation.

To the participating laboratory is required to undertake one (1) independent determination in each sample, preferably in five (05) different days, analyzing a couple a day, employing one or more validated analytical methods. The methods used should be reported with the results. The samples must be analyzed as ordinary routine samples of the laboratory, without any special treatment.

The parameters to be determinate in each sample are listed below:

Total Fe, FeO, Al₂O₃, SiO₂, Mn, TiO₂, P, CaO, MgO, K₂O, Na₂O and LOI (Loss On Ignition)

ANALYTICAL METHODS

The Participant should use its routine procedure in Iron Ore Analyses. ITAK suggests the following analytical methods for this Proficiency Test:

- ✓ **Total Fe:** Fusion and determination by XRF or Acid digestion and Titrimetric Method;
- ✓ **FeO:** Titrimetric Method;
- ✓ **Al₂O₃, Mn, TiO₂, P, CaO, MgO, K₂O, Na₂O:** Fusion and determination by AAS or ICP-OES or XRF;
- ✓ **SiO₂:** Digestion followed by gravimetric method or Fusion and determination by XRF;
- ✓ **LOI (Loss on Ignition):** Gravimetric Method.

The methods used should be informed following, whenever possible, the standard “Digestion Technique / Instrument Finish” using simplified codes as examples below:

- ✓ Fusion and X-Ray Fluorescence finish: **FUS-XRF**;
- ✓ Pressed Pellet and X-Ray Fluorescence finish: **POP-XRF**;
- ✓ Fusion and ICP-OES finish: **FUS-ICP**;
- ✓ Four acid digestion (HF,HNO₃,HClO₄,HCl) and ICP-OES finish: **DIG4AC-ICP**;
- ✓ Acid digestion (HCl) and Titrimetric finish: **DIGAC-TIT**;
- ✓ Four acid digestion (HF,HNO₃,HClO₄,HCl) and Atomic Absorption Spectrometry: **DIG4AC-AAS**;
- ✓ Four acid digestion (HF,HNO₃,HClO₄,HCl) and Gravimetric finish: **DIG4AC-GRA**;
- ✓ Four acid digestion (HF,HNO₃,HClO₄,HCl) and Colorimetric finish: **DIG4AC-COL**;
- ✓ Gravimetric Method: **GRA**;
- ✓ Thermogravimetric Analyse: **TGA**.

SCHEDULE FOR 2021 ROUNDS

The proposed schedule for 2021 is presented in the table below but can be adjusted as required. The official schedule should be visited through the PTP Management System.

Steps of the Program	1st Round 2021 (43rd round)	2nd Round 2021 (44th round)	3rd Round 2021 (45th round)	4th Round 2021 (46th round)	5th Round 2021 (47th round)
1- Sending invitations	18/Jan/2021	--	--	--	--
2-Confirmation of participants	05/Feb/2021				
3- Sending samples to the participants	08/Feb/2021	12/Apr/2021	16/Jun/2021	16/Jul/2021	01/Sep/2021
4- Receiving samples by the participant	22/Feb/2021	26/Apr/2021	30/Jun/2021	30/Jul/2021	15/Sep/2021
5- Completion of the Analyses and report the results by the participants	05/Apr/2021	01/Jun/2020	04/Aug/2021	03/Sep/2021	22/Oct/2021
6- Preparation and delivery of Performance Report to the participants.	19/Apr/2021	15/Jun/2020	18/Aug/2021	17/Set/2021	05/Nov/2021

Note: the dates in bold (item 5) must be met to avoid delays in issuing the results, which can compromise the subsequent rounds of the program.

If delays occur, the Program Coordination must be contacted to assess the possibility of extending the deadline without compromising the schedule or loss to the other participants.

If there are unjustified delays, ITAK may close the rounds without the missing results.

For each round, the instructions will be sent along with the samples, containing guidelines on how the laboratory should proceed, and specific information about the samples such as expected levels of the analyte (s).

REQUIREMENTS FOR PARTICIPATION

The Laboratory interested in participating in the Proficiency Testing Program for Gold Ore Analysis - ITAK - 2021 should be a legal responsible organization with technical capacity and equipment to carry out the chemical analysis of its scope; complete the registration form on the ITAK website at <https://pep.itak.com.br/login.php> , confirming its participation until the deadline set in the schedule.

PERFORMANCE REPORT

For each round of the Proficiency Test Program in Iron Ore Analyses – 2021, ITAK will issue a personalized digital Interlaboratory Performance Evaluation Report under confidentiality identification for the internal evaluation of the Participant Laboratory and identifying improvement opportunities.

The Performance Report is structured following the ISO / IEC 17043 requirements.

If the participant wants to receive the report of another unit of the same business group, it must be requested directly to the person in charge, or through a formal authorization from the person in charge. Preliminary reports will not be issued.

If required, ITAK may rectify or ratify reports provided that such corrections do not require further statistical processing of data. All rectification generates a new version and new report number that will replace the previous version when published and communicated.

ITAK Interlaboratory Performance Report is accepted as an ISO/IEC 17025 requirement.

INVESTMENT

Request us a proposal by email: tecnologia@itak.com.br.

ITAK has an attractive discount policy such as: participation of several units companies belonging to the same economic group, discounts for laboratories participation in more than one PT, discounts for purchase ITAK's CRM, etc.

Find out more by contacting us through: interlab@itak.com.br

All customs duties are participants' responsibility.

The participant is responsible for the bank transfer taxes. The bank expenses must be not shared.

SUBCONTRACT ACTIVITIES

For this PT, homogeneity tests analyses of Reference Materials used as samples (test items) can be subcontracted from competent laboratories.

COORDINATION TEAM

Bráulio de Freitas Pessoa – Technical Director

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João Monlevade, Brazil, January 16th