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2025 Custom Chemical Unknown (Inorganic Chemical) Proficiency Test
FTS-25-CHEM4 Summary Report

The Submission Deadline for this test was July 25, 2025

The test was manufactured by FTS at the FTS Laboratory Facility (127 W. Grand River Avenue, Williamston, MI 48895) and all activities were coordinated by Rebecca Smith (rsmith@forsci.com), Proficiency Test Program Manager. Ms. Smith is also authorizing the release of this report. This is the summary report issued on 8/12/25. FTS considers all reports confidential and does not release information regarding participant's results without authorization from that participant.

Summary

Test results were received in 9 of 9 tests distributed (100% response rate). Of the 9 respondents:

Item 1 (Potassium Chloride)
8 of 9 (89%) reported that Item 1 contained Potassium Chloride.
1 of 9 (11%) reported that Item 1 contained Calcium Chloride.

Item 2 (Magnesium Sulfate)
9 of 9 (100%) reported that Item 2 contained Magnesium Sulfate.

Item 3 (Calcium Chloride)
8 of 9 (89%) reported that Item 3 contained Calcium Chloride.
1 of 9 (11%) reported that Item 3 contained Potassium Chloride.

Manufacturer's Information

All items for the test were prepared at different times.

Item 1 was produced by weighing ~0.5g Potassium chloride (Sigma Aldrich Lot# SLCK8557, Item P5405-250G) using a calibrated Mettler PB1502 balance. The material was transferred into a Qorpak 1-dram glass vial (Lot# 02022022144, GLC-05185) and labeled. The item was further heatsealed inside an AMPAC envelope, sealed and labeled per FTS guidelines.

Item 2 was produced by weighing ~0.5g Magnesium sulfate (PURE Lot# 124994, UPC X001KMM2DL) using a calibrated Mettler PB1502 balance. The material was transferred into a Qorpak 1-dram glass vial (Lot# 02022022144, GLC-05185) and labeled. The item was further heatsealed inside an AMPAC envelope, sealed and labeled per FTS guidelines.

Item 3 was produced by weighing ~0.5g Calcium chloride (LD Carlson, UPC 8869026103) using a calibrated Mettler PB1502 balance. The material was transferred into a Qorpak 1-dram glass vial (Lot# 02022022144, GLC-05185) and labeled. The item was further heatsealed inside an AMPAC envelope, sealed and labeled per FTS guidelines.

The three items with matching UTICs were packaged together in a 6” x 9” manila envelope, sealed and labeled per FTS guidelines.

Assigned Value

Proficiency tests under ISO 17043:2023 are assessed via comparison of the participant result to the assigned value of a proficiency test item or items. For quantitative tests, FTS determines the assigned value based on statistical methods described in ISO 13528:2022. For qualitative tests, the FTS study coordinator determines the assigned value based on a number of factors, including product source information, internal and/or external pre-distribution laboratory analysis, and consensus of responses (consensus value).

Quality systems and laboratory reporting guidelines vary greatly from laboratory to laboratory, therefore participating laboratories and their accrediting bodies are responsible for the assessment of whether a reported result is an outlying result.

For this proficiency test, the following assigned values are based on source information which was then confirmed by laboratory analysis:

Item 1: Potassium chloride
Item 2: Magnesium sulfate
Item 3: Calcium chloride

Please identify any inorganic chemicals in the submitted items.

Items Submitted

Item 1: Sample of questioned material.
Item 2: Sample of questioned material.
Item 3: Sample of questioned material.

3) Indicate all methods used for analysis (select all that apply):

A) ☐ Macro/Microscopic Examinations

B) ☐ Chemical Spot Tests

C) ☐ GC/FID/TEA/ECD

D) ☐ GC/MS

E) ☐ IC

F) ☐ SEM/EDS

G) ☐ Thin Layer Chromatography

H) ☐ PLM

I) ☐ HPLC

J) ☐ IR/FTIR Analysis

K) ☐ ICP-MS

L) ☐ CE

M) ☐ XRD

N) ☐ XRF

O) ☐ HPLC/MS

P) ☐ DART TOF-MS

Q) ☐ UV Fluorescence

R) ☐ pH

S) ☐ Raman Spectroscopy

T) ☐ ICP-AES

U) ☐ Commercial Test Strips

UTIC	Webcode	Indicate all methods used for analysis (select all that apply):
p20251541	W182	Macro/Microscopic Examinations; PLM; IR/FTIR Analysis
p20251542	W061	Macro/Microscopic Examinations; IC; XRF
p20251543	W040	Macro/Microscopic Examinations; SEM/EDS; PLM; IR/FTIR Analysis
p20251544	W160	IC; SEM/EDS; IR/FTIR Analysis
p20251545	W153	IC; ICP-MS; XRF; Raman Spectroscopy
p20251546	W012	Macro/Microscopic Examinations; SEM/EDS; Chemical Spot Tests; IR/FTIR Analysis; Raman Spectroscopy
p20251547	W053	XRD; XRF
p20251548	W103	ICP-AES; IC; IR/FTIR Analysis
p20251549	W130	Chemical Spot Tests; IR/FTIR Analysis; Macro/Microscopic Examinations; XRD; XRF

4) Other methods used (if none, please enter "N/A"):

UTIC	Webcode	Other methods used
p20251541	W182	chloroplatinic acid crystal test
p20251542	W061	Solubility
p20251546	W012	Analytical Balance

5) Please identify any inorganic chemicals in Item 1:

UTIC	Webcode	Please identify any inorganic chemicals in Item 1
p20251541	W182	potassium chloride
p20251542	W061	potassium chloride
p20251543	W040	potassium chloride
p20251544	W160	Potassium Chloride
p20251545	W153	Potassium chloride
p20251546	W012	potassium chloride
p20251547	W053	Potassium chloride
p20251548	W103	Calcium Chloride
p20251549	W130	Potassium chloride

6) Please identify any inorganic chemicals in Item 2:

UTIC	Webcode	Please identify any inorganic chemicals in Item 2
p20251541	W182	magnesium sulfate
p20251542	W061	magnesium sulphate
p20251543	W040	magnesium sulfate
p20251544	W160	Magnesium Sulphate
p20251545	W153	Magnesium sulfate
p20251546	W012	magnesium sulfate
p20251547	W053	Magnesium sulphate hydrate
p20251548	W103	Magnesium Sulfate
p20251549	W130	Magnesium sulfate (indication)

7) Please identify any inorganic chemicals in Item 3:

UTIC	Webcode	Please identify any inorganic chemicals in Item 3
p20251541	W182	calcium chloride
p20251542	W061	calcium chloride
p20251543	W040	calcium chloride
p20251544	W160	Calcium Chloride
p20251545	W153	Calcium chloride
p20251546	W012	calcium chloride
p20251547	W053	Calcium chloride hydrate
p20251548	W103	Potassium Chloride
p20251549	W130	Calcium chloride (indication)

8) How long did it take to complete this test (in hours)? Please report actual analytical hours only.

9) Did you find this test to be a fair test of the process of the examination and interpretation of chemical unknowns?

A) ○ Yes

B) ○ No

UTIC	Webcode	How long did it take to complete this test (in hours)? Please report actual analytical hours only.	Did you find this test to be a fair test of the process of the examination and interpretation of chemical unknowns?
p20251541	W182	8	Yes
p20251542	W061	5	Yes
p20251543	W040	10	Yes
p20251544	W160	7 hours	Yes
p20251545	W153	8	Yes
p20251546	W012	6	Yes
p20251547	W053	8	Yes
p20251548	W103	2	Yes
p20251549	W130	21	Yes

10) How would you change the aspects of the test (i.e. scenario, test samples, question sections, report format) to improve a future version of this test? Comments and suggestions are welcome.

Additionally, this question is a means to provide you with an opportunity to explain or include information about your findings or interpretation, as needed. In order to maintain confidentiality, please refrain from including identifying information specific to your laboratory.

UTIC	Webcode	How would you change the aspects of the test (i.e. scenario, test samples, question sections, report format) to improve a future version of this test? Comments and suggestions are welcome.	FTS Response
p20251544	W160	No scenario was provided	Thank you for your comment. FTS does not include case scenarios and does not assess evidence interpretation and significance.
p20251546	W012	N/A-changes/suggestions Regarding Item 2 & Item 3, examinations indicated & identified a hydrated version of those compounds.	