Universal Multiple-Octet Coded Character Set
International Organization for Standardization
Internationale Standardisierungs-Organisation
Organisation Internationale de Normalisation
Διεθνής Οργανισμός Τυποποίησης
Международная организация по стандартизации

Doc Type: Working Group Document

Title: Proposal to encode historic alchemical symbols

Source: Uwe Mayer, Siegmund Probst, David Rabouin, Elisabeth Rinner,
        Andreas Stötzner, Achim Trunk, Charlotte Wahl
Version: 2nd, revised
Previous version: L-2432 (L2/25-131)
Related: L-2443
Status: forward to Script Encoding Workgroup / WG2
Action: for expert review and encoding pipeline
Date: May 7, 2025
Requester's reference: LUCP L-2517

1. Background

In response to the first version of this proposal we received an extensive commentary by Kirk Miller. This questionaire, with replies by A. Stötzner, is provided as doc. L-2443, it is the background of several issues discussed in this new version of the proposal.

There were also discussions during the Zoom meeting on April 29. As a result, the proposed symbol

ALCHEMICAL SYMBOL FOR HORA-2

has been dropped; it is now regarded to be represented by character 29D6. Instead of a new character we propose new annotations for characters 231B, 29D6 and 1F76E.

2. Alchemical symbols

We propose the addition of six alchemical symbol characters to the UCS. Some of them relate to existing alchemical/astrological characters. Since there is not enough slots left in the Alchemical Symbol's block 1F700, we propose a new code chart "Alchemical Symbols Extension" which ought to be big enough to accomodate even more possible future additions, since the field of alchemical notation is rather extensive and complex.

3. Characters

If this proposal gets accepted, the following new characters will exist:

⚬ ALCHEMICAL INVERTED SYMBOL FOR OIL

♃ ALCHEMICAL SYMBOL FOR MOON-JUPITER

♄ ALCHEMICAL SYMBOL FOR TARTAR-SALT

☉ ALCHEMICAL SYMBOL ENCLOSED SUN

☽ ALCHEMICAL SYMBOL ENCLOSED MOON

♂ ALCHEMICAL SYMBOL FOR RETORT-2

4. Annotations – *Hora* characters

The current situation with various "hour" symbols is partly confusing and needs a revision.
The previously proposed ⧗ *ALCHEMICAL SYMBOL FOR HORA-2* is to be unified with character
29D6 ⧗ WHITE HOURGLASS. In order to reflect the alchemical usage properly, we propose
three annotation changes in the standard:

4.1.

The current annotation to 231B is incorrect because this *pictographic* version of the hourglass
symbol is used as a modern user interface symbol, but *not* in historic alchemical notation. Hence
we propose a change of annotations:

231B ⌛ HOURGLASS
        → **29D6 white hourglass**
        • **in Alchemy 29D6 or 1F76E is used**
        = alchemical symbol for hour   –   to be deleted

4.2.

So far a reference to Alchemy is missing in the annotations to 29D6. We propose:

29D6 ⧗ WHITE HOURGLASS
        = vertical bowtie
        = white framus
        • **alchemical symbol for hour, simple form**
        → **1F76E alchemical symbol for hour**
        → 231B hourglass

4.3.

In the Alchemy block 1F700 the most widely used simple form of the alchemical *hora* symbol is
neither represented nor reflected so far. The existing 1F76E is a calligraphically embellished vari-
ant form of the common simple alchemical *hora* sign which is testified in many sources and which
is to be represented by 29D6. Therefore we request two additional annotations:

1F76E ⚜ ALCHEMICAL SYMBOL FOR HOUR
        • **simple form is 29D6**
        → **29D6 ⧗ white hourglass**
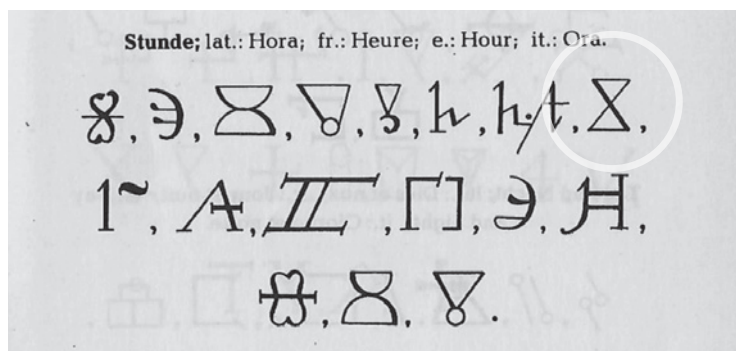   → 231B ⌛ hourglass

The proposed annotations will help to clarify the differences and best-practice use cases for 29D6 as well as for the other related characters. On this and the following page examples of the wide-spread use of the simple X-shaped *hora* symbol (in previous version proposed as ⚔ *ALCHEMICAL SYMBOL FOR HORA-2*) are demonstrated.
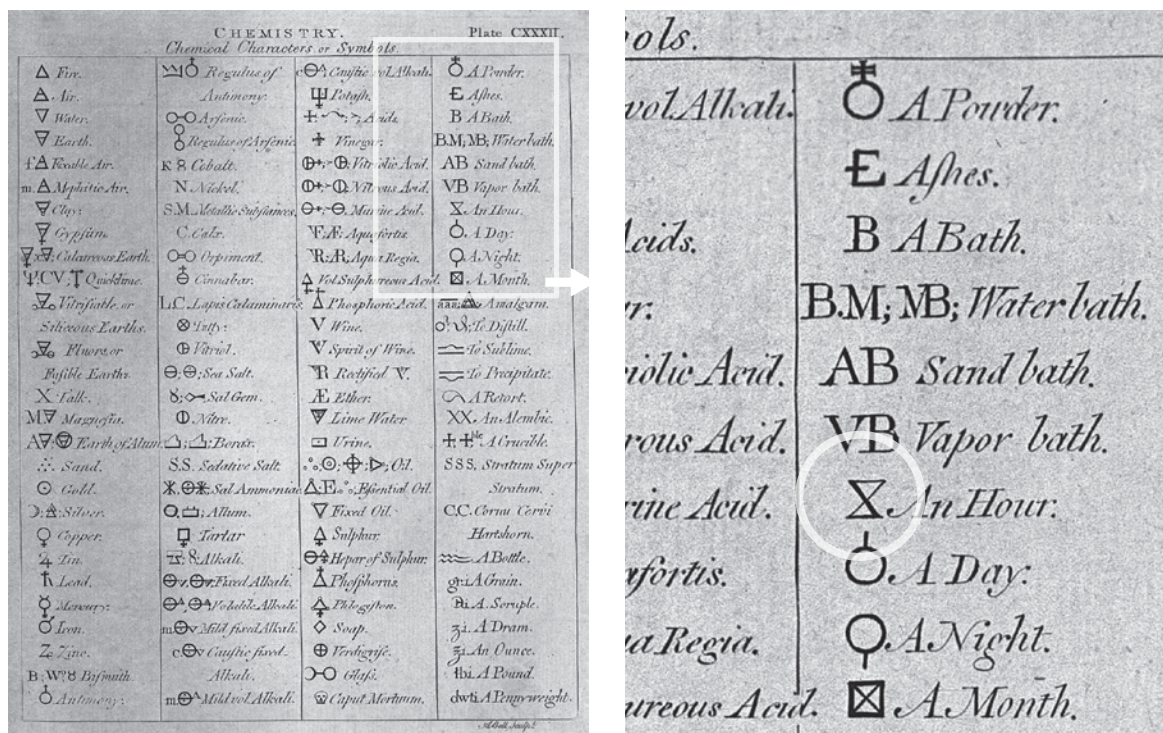
Engraving of Andrew Bell (1726–1809). The straight hora symbol ist listed here as the sole form. Source: Welcome collection (https://wellcomecollection.org/works/s5vs9bfr)

From a 1671 copperplate; showing the straight variant at 1st position. Basil Valentine: The Last Will and Testament of Basil Valentine. (Source: Newton N3584 Alchemy Unicode Proposal – March 31 2009.pdf)


From Geßmann's book (1964)

Table from Karl Gottfried Hagen, Grundriß der Experimentalchemie (1786); after Schneider 1964.

From: Medicinisch-Chymisches und Alchemistisches Oraculum (Ulm 1755); after Schneider 1964.

The simple hora symbol in sole position, from Ernesti 1733.

5. Figures and explanations

Con l'occasione del rammollire del ferro, communicherò à V. S. Ill. una cosa assai curiosa communicata al Sr Bodenhausen d'un Signore Curioso che si è dimandato Francesco Miniti. Intorno all'Ammollir il |:vetro:| ℞ latte di Capra, aceto forte, ♒ di uliva, Aloë Epatico, ♑ laurino, orina di ragazzi ana. Fà bollire in un vaso invetriato nuovo il |:vetro:|, lascialo nell'infusione caldo in detto mestruo per 1 notte e la mattina opera. Si è fatta la prova in Parma d'uno chiamato Ottici con una Medaglia del Papa e dell'Imperatore in un |:vetro:| verde e riuscì pulitissimo, che poi rassoda come prima.

♒ ALCHEMICAL INVERTED SYMBOL FOR OIL. Graphically based on the glyph of the common oil symbol, which gets rotated 180 degrees. Here the meaning of the inverted character is "boiled oil" in contrast to "[just] oil", both characters do occur alongside each other here.
LAA III-8 p. 248
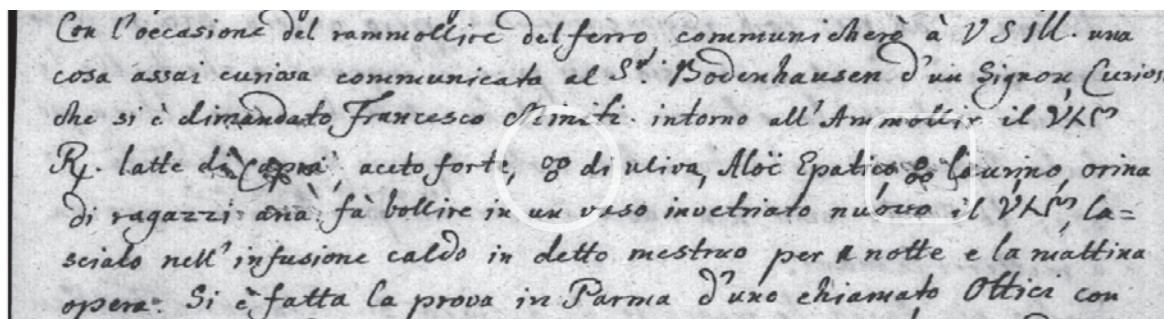
♒ ALCHEMICAL INVERTED SYMBOL FOR OIL.
The corresponding part of the original MS source, a letter from M. G. Block for Leibniz, 1699.
Source: LBr 75 fol. 30v

♒ ALCHEMICAL INVERTED SYMBOL FOR OIL. From: Weigel 1777 (source: Google Books)

m. h. H. ob nicht die destillation sine affuso liquore per descensum geschehe in diesem n° 3
wirdt keiner destillation sine affuso liquore gedacht, sondern die rectificatio ♅ geschicht
in dem ⊕ purificatiss. in ein weiswullen zeug gebunden wirdt, alß ein knopff, daran man ein
faden last, thut den ♅ in ein Zuckerglaß hanget dan daß ⊕ri hinein, so solvirt die phlegma
5 daß ⊕ri, vnd fält gleichsam tropffenweiß wie ein regen auf den boden v. wirdt also der
♅ von der phlegma geschieden, vnd man alßdan per Separatorium scheidet. N° 7 vnd
8 destilliret man sine affuso liquore aber nicht per descensum, sondern wie gebrauchlich
vnd bestehet die kunst nur an den Zinnern, kupffern, vnd gläsern gefäßen, ist sehr curios
nutzlich vnd leicht. N° 9 Menstruum Willisii ist nicht spiritus Zwelfferi ♀ris welcher von
10 dem soluto nicht totaliter kan geschieden werden, sondern es ist sal ⊊ri purificatiss. wie
Willis in tractatu de fermentatione dessen operation klärlich mit dem ⇲re entdecket, aber
daß ⊕ri verschweiget. N° 10 Lilium Paracelsi verum wirdt allein aus ♄, oder auch mit Zu-
setzung anderer metallen alß ☉ so ist es universal, oder mit ♀, ♂, ♃, etc. so ist eß particular
vnd gewissen membris vnd kranckheit appropriret, gemacht, habe eß auch gemacht aber
15 doch ohne den Alkaest, das aber Coagulum Victrioli hier lilium Paracelsi genandt, ge-
schicht propter albedinem et similitudinem, solche coagulation wirdt auch ohne Zu-
thuung einiges salzes gemacht, sondern mit einer trucknen Erden so aus Italien kompt vnd

⊕ ALCHEMICAL SYMBOL FOR TARTAR-SALT
LAA III-2 p. 512 – *Volume 2 of LAA series III is currently not available in digitized form.*
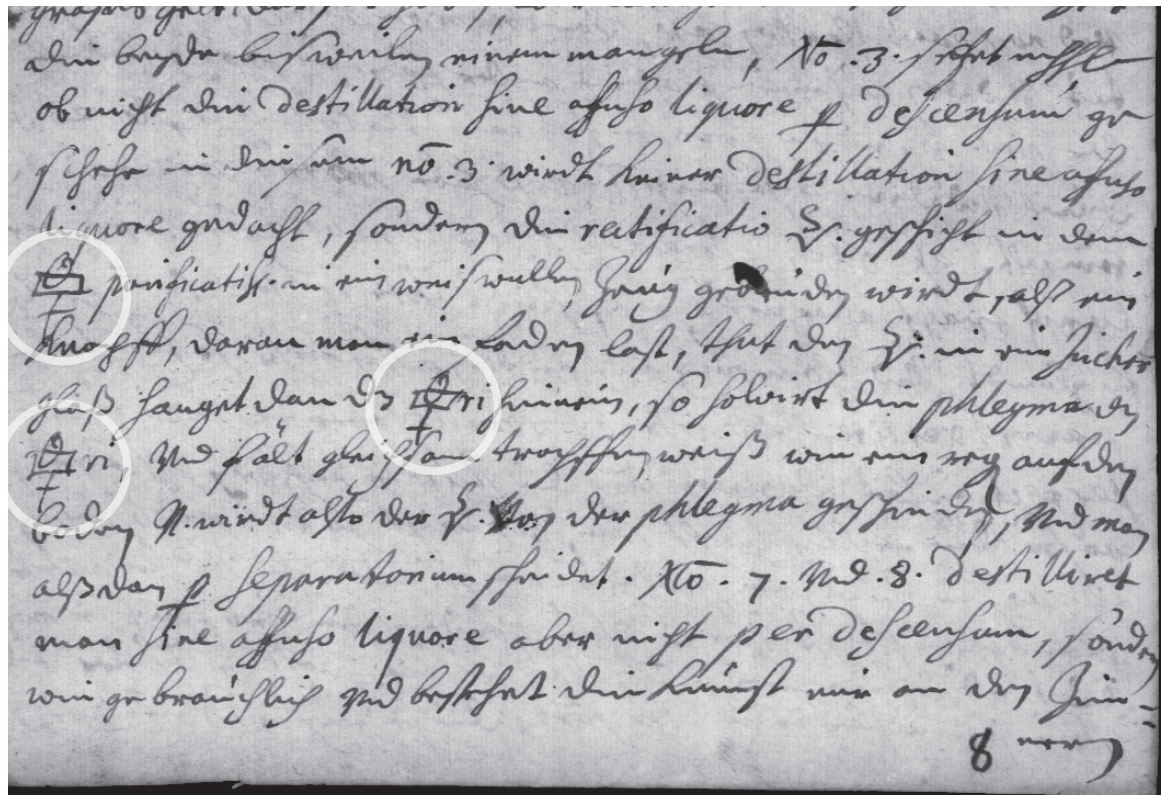
⊕ ALCHEMICAL SYMBOL FOR TARTAR-SALT
The corresponding part of the original MS (a letter from J. H. Kornmann for Leibniz, 1678).
Source: LBr 496 fol. 3v

ohne diese Massa aber auf gemeine art weich vnd zu Kalck, dieses habe offters eigenhandig
gemacht. N° 12. ☿ per se zu praecipitiren ist gantz leicht, wan man nur erst daß glaß hat
15 woran daß gantze secret hanget. N° 24 bey der separation ☉ v. ☽ ex ♃ ist kein verlust
sondern gewin, weil aber der ♃ ohne Arsenic vnd andere schädliche sachen nicht wohl zu
zwingen oder sich capelliren läst, ist es nicht fur Curiose leute so ihr zeit vnd gesundheit
besser anzuwenden wissen, doch wan man erst ♃ in cineres bringt vnd selbige wieder in
ein Corpus redigieret, ist solche operation nicht so schadlich, aber doch bey beyden modis
20 grose rüche vnd zeitversäumnüß also mehr für grobe arbeitsamme leut so es wie ein handt

♃ ALCHEMICAL SYMBOL FOR MOON-JUPITER denotes *silver-bearing tin* in this text.
LAA III-2 p. 514
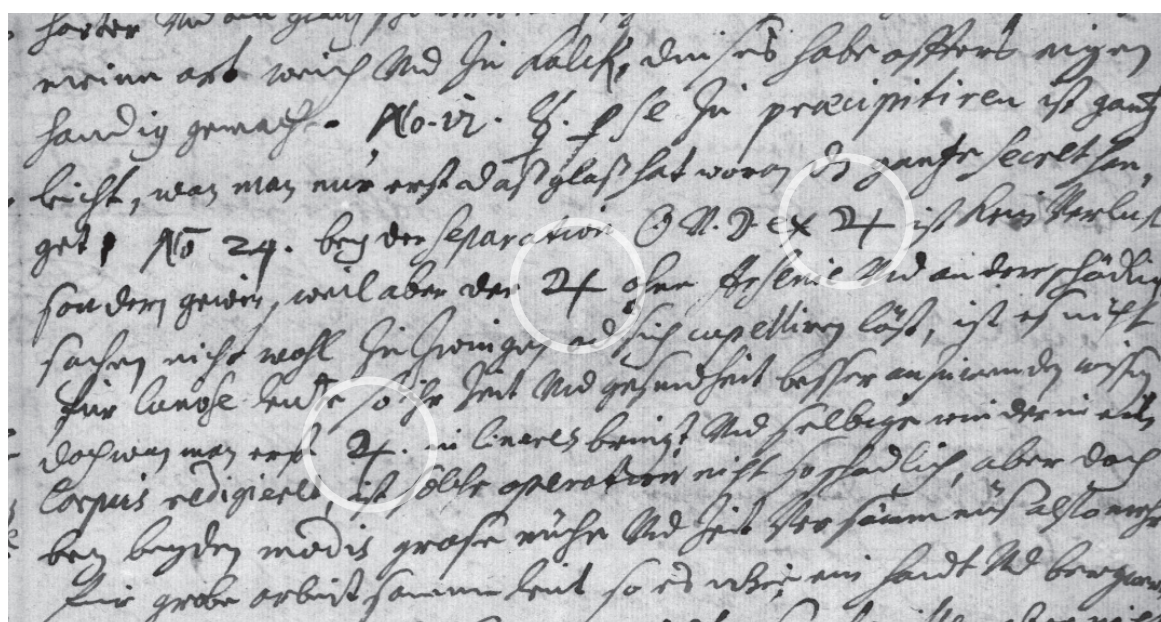
♃ ALCHEMICAL SYMBOL FOR MOON-JUPITER
The corresponding part of the above sample, from the original MS (a letter from J. H. Kornmann
for Leibniz, 1678). Source: LBr 496 fol. 5r
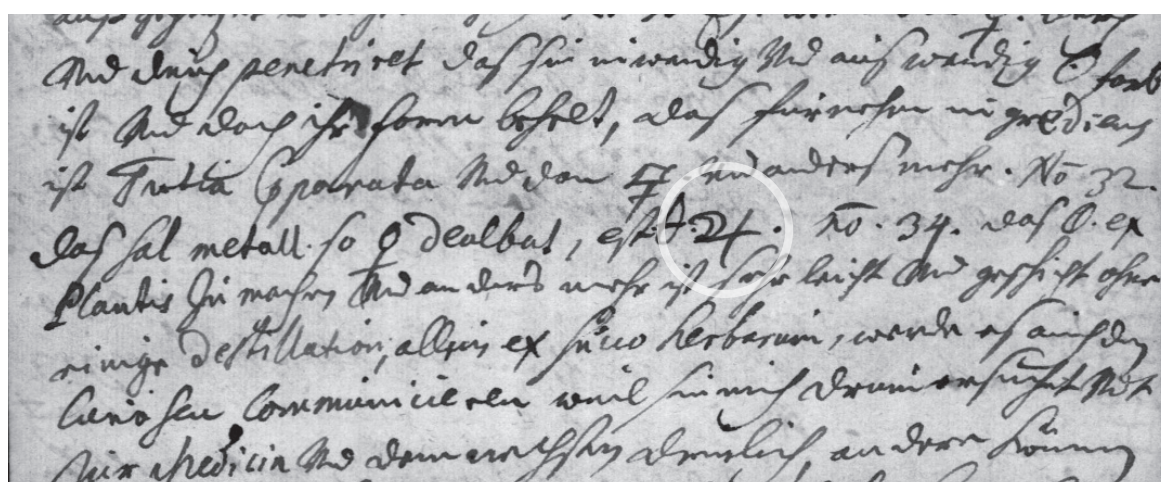
Another example from the same text. Source: LBr 496 fol. 3v

Nunc conferendo aequatione☽ ☽ et ☉ tuto licebit invenire ipsas n.e.m. ac proinde omnes evolvere collatitias ad ultimam usque. Et primum ex terminis secundis fiet:

$$\frac{4d^3ag\lambda + a^3\varphi\lambda n + 4a^3b\lambda e - d^4a\beta - ad^2a\beta n - [a^3e\beta]n}{+ d^4\lambda + and^2\lambda + a^3e\lambda} \sqcap m. \quad \text{et}$$

☉ ALCHEMICAL SYMBOL ENCLOSED SUN, originally denotes *foliated gold;*
☽ ALCHEMICAL SYMBOL ENCLOSED MOON, originally denotes *foliated silver.*
This example shows a 'borrowed' usage of the two alchemical symbols in a mathematical script. It was not uncommon in those days to take certain symbols from another background and use them in a different context and with a different meaning. In this case the meaning is just that of reference marks; the symbols are, however, clearly belonging to the alchemical notation system by their origin. LAA VII-2 p. 420 – *Volume 2 of LAA series VII is currently not available in digitized form*.
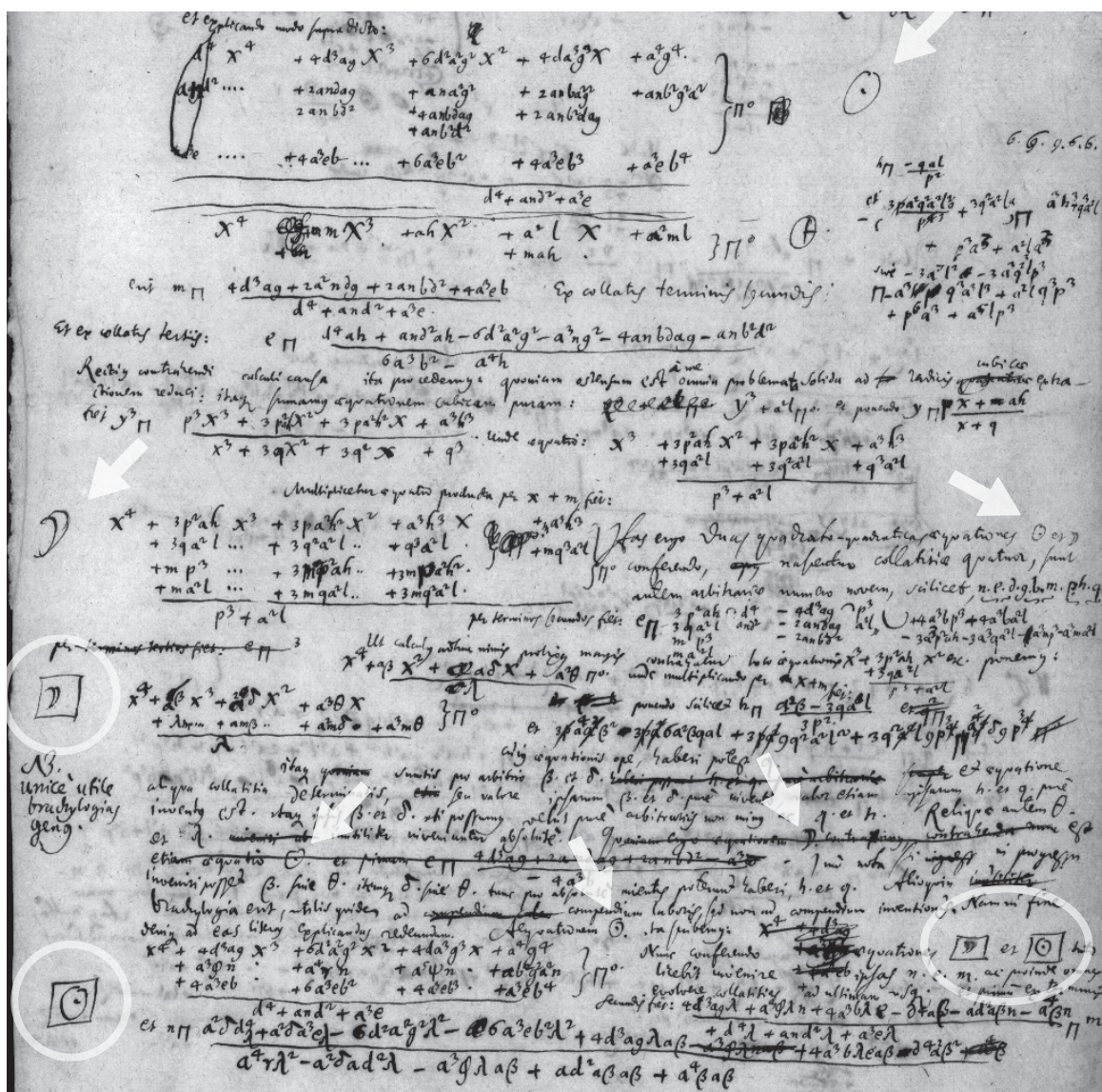
☉ ALCHEMICAL SYMBOL ENCLOSED SUN and ☽ ALCHEMICAL SYMBOL ENCLOSED MOON as they appear alongside the ordinary sun and moon (gold/silver) symbols (➜) in the corresponding MS. source: LH 35 14 1 fol. 230v

Tafel XXI

Goldblatt, Blattgold; lat.: Aurum foliatum; fr.: Or en feuil-les; e.: Foliated Gold; it.: Foglia d'oro (Oro fogliato).

Goldfeilspäne; lat.: Limatura auri; fr.: Limaille d'or; e.: Gold-dust; it.: Limatura d'oro.

Goldgeist; lat.: Spiritus auri; fr.: Esprit d'or; e.: Gold-spirit; it.: Spirito d'oro.
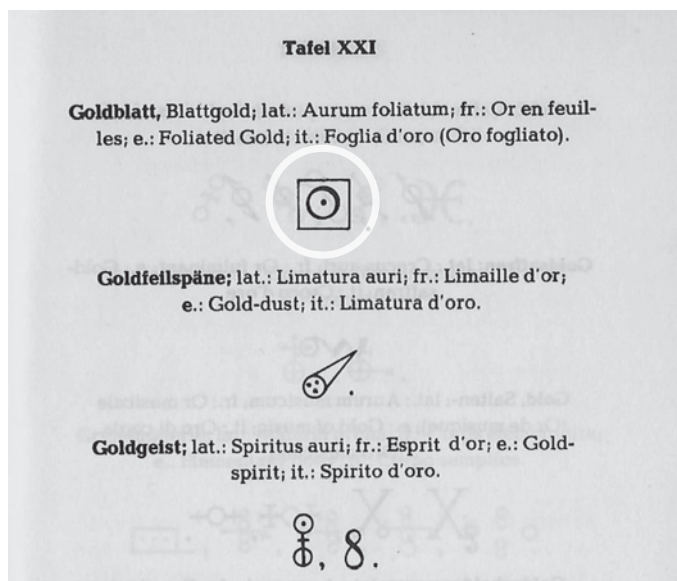
⊚ ALCHEMICAL SYMBOL
ENCLOSED SUN,
☽ ALCHEMICAL SYMBOL
ENCLOSED MOON,
here shown in their original alchemical context; from Geßmann's concise book on alchemical symbols (1964).

Tafel LXI

Silberblatt; lat.: Argentum foliatum; fr.: Agent en feuilles; e.: Foliated silver (Leaf of beaten silver); it.: Foglia d'argento.

Silbergeist; lat.: Spiritus argenti; fr.: Esprit d'argent; e.: Silver-spirit; it.: Spirito d'argento.
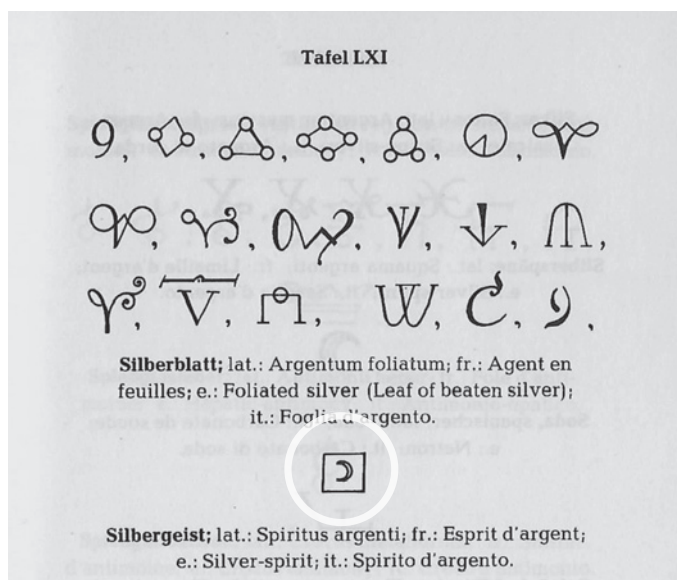
⊚ ALCHEMICAL SYMBOL
ENCLOSED SUN,
from Ernesti 1733.

Medicinische Zeichen. 43

Medicinische und Apothecker-Zeichen.

⊙	Aurum, Gold.	℈. d.	Destilliren.
⊚	Aurum foliatum, Blätleins-Gold.	♂	Dies, Tag.
⊙	Aurum limatum, gefeilt Gold.	⅛	Digeriren.
⊙P.	Aurum potabile, trinkbar Gold.	ℨ	Drachma, Quintlein.
B.	Balneum, Bad.	‡ Eff.	Essentia, Essenz.
MB.	Balneum Mariae, s. Maris.	℞	Faeces vini, Weinhefen.
VB.	Balneum vaporis, s. Roris.	⊙	Farina, Meel.
	Borax, Borras.		Farina laterum, Ziegel-Meel.
ƶ	Caementiren.	♂	Ferrum, Eisen.
♄	Calciniren.	33	Filtrare, durchseigen.
C.	Calx, Kalch.	≋	Fluere, fließen.
♄	Calx viva, ungelöschter Kalch.	♃	Fuligo, Ruß.
≋.yr.	Camphora, Campher.	♀	Fumus, Rauch.

Kirk Miller discusses the option of representing ◎ and 𝔇 by use of ☉ (2609) and 𝒟 (263D) together with 20DE COMBINING ENCLOSING SQUARE. In order to verify this approach in practice we have viewed the paragraph about this matter in various typical usage scenarios.

Hora-2, as 'white hourglass', is also found in the Newton Corpus (btm, under 'editorial marks'), and wasn't requested separately.

The square for foil is productive, being used for any malleable metal. One possibility would be U+20DE COMBINING ENCLOSING SQUARE, for 𝒟□ (silver foil) and ☉□ (gold foil), and so on with ☾□ (a variant of silver foil), ♃□ (tin foil or old-style electrum foil), ☿□ (old-style tin foil), ♀□ (copper foil), ♂□ (iron foil), and ♂□ (old-style variant for gold foil). I haven't seen it with Saturn for lead foil.

[Andreas, on my browser the Venus and Mars symbols show up as colored emojis. That behaviour can be suppressed.]

If you take a look at folio 6 of Marcianus, you'll see multiple instances of an allograph of this convention, where the square is instead attached to the bottom of the planetary symbol to indicate a foil of the planetary metal, e.g. attached to the old symbol U+1F71A ♂ for sun/gold for gold leaf/foil (3rd symbol from top, left column), on 𝒟 Moon for silver foil (no. 11), on ♀ Venus for copper foil (no. 17), on an old variant of ♂ Mars for iron foil (no. 24, 3rd from the btm), and on Mercury for tin foil (no. 17 in the 2nd column), using an old identification of Mercury rather than Jupiter as the governing planet of tin.

a) A part of Kirk Miller's original explanations, viewed in a webmailer (Firefox, Mac).
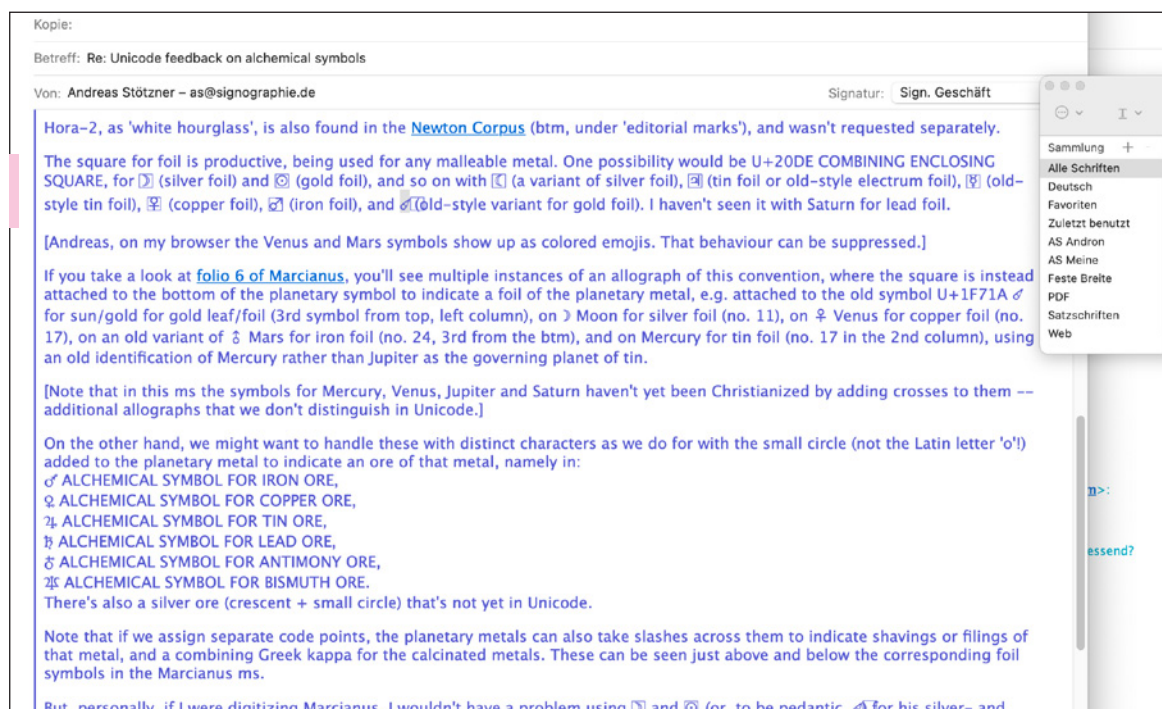
b) A part of Kirk Miller's original text, viewed in Mac's Mail program. Note the different display behaviour of combined sequences.

copied from Mail into TextEdit:
The square for foil is productive, being used for any malleable metal. One possibility would be U+20DE COMBINING ENCLOSING SQUARE, for ⛢ (silver foil) and ⊛ (gold foil), and so on with ☾ (a variant of silver foil), ♃ (tin foil or old-style electrum foil), ☿ (old-style tin foil), ♀ (copper foil), ♂ (iron foil), and ☉ (old-style variant for gold foil). I haven't seen it with Saturn for lead foil.

copied from Webmailer (Firefox) into TextEdit:
The square for foil is productive, being used for any malleable metal. One possibility would be U+20DE COMBINING ENCLOSING SQUARE, for ⛢ (silver foil) and ⊙ (gold foil), and so on with ☾ (a variant of silver foil), ♃ (tin foil or old-style electrum foil), ☿ (old-style tin foil), ♀ (copper foil), ♂ (iron foil), and ☉ (old-style variant for gold foil). I haven't seen it with Saturn for lead foil.

c) Here a part of the original text has been copied into a simple text editor (TextEdit, Mac). Note the particular fail of the 'gold foil' symbol in the top section and the inconsistent display of 20DE, picked randomly by the OS from various fallback fonts. Note also the planet's glyphs clashing with the square box of 20DE.

plain text copied from TextEdit into Word:
The square for foil is productive, being used for any malleable metal. One possibility would be U+20DE COMBINING ENCLOSING SQUARE, for ☽ (silver foil) and ⊙ (gold foil), and so on with ☾ (a variant of silver foil), ♃ (tin foil or old-style electrum foil), ☿ (old-style tin foil), ♀ (copper foil), ♂ (iron foil), and ☉ (old-style variant for gold foil). I haven't seen it with Saturn for lead foil. [Cambria, symbols random font fallbacks]
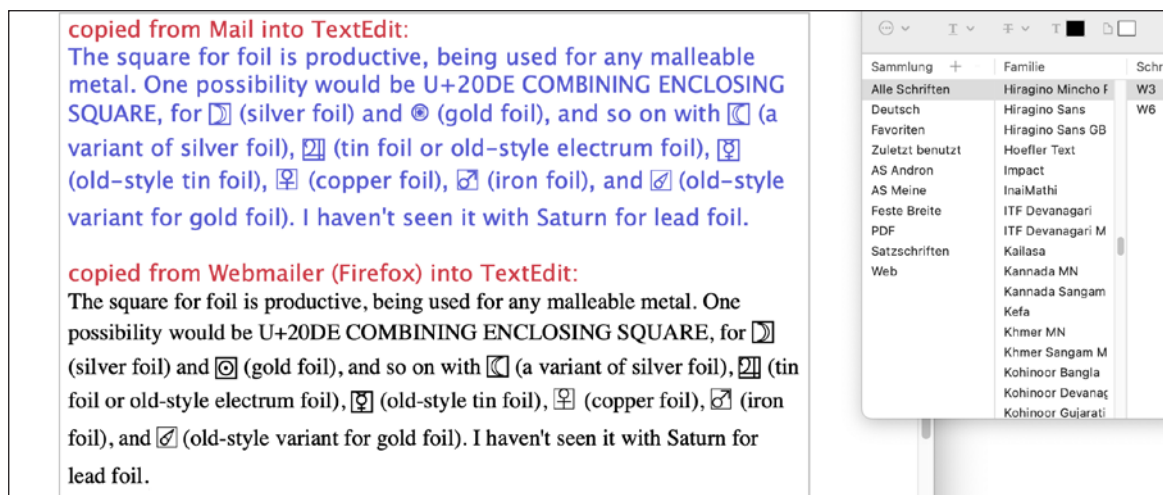
The square for foil is productive, being used for any malleable metal. One possibility would be U+20DE COMBINING ENCLOSING SQUARE, for ☽ (silver foil) and ⊙ (gold foil), and so on with ☾ (a variant of silver foil), ♃ (tin foil or old-style electrum foil), ☿ (old-style tin foil), ♀ (copper foil), ♂ (iron foil), and ☉ (old-style variant for gold foil). I haven't seen it with Saturn for lead foil. [Times New Roman, symbols random font fallbacks]
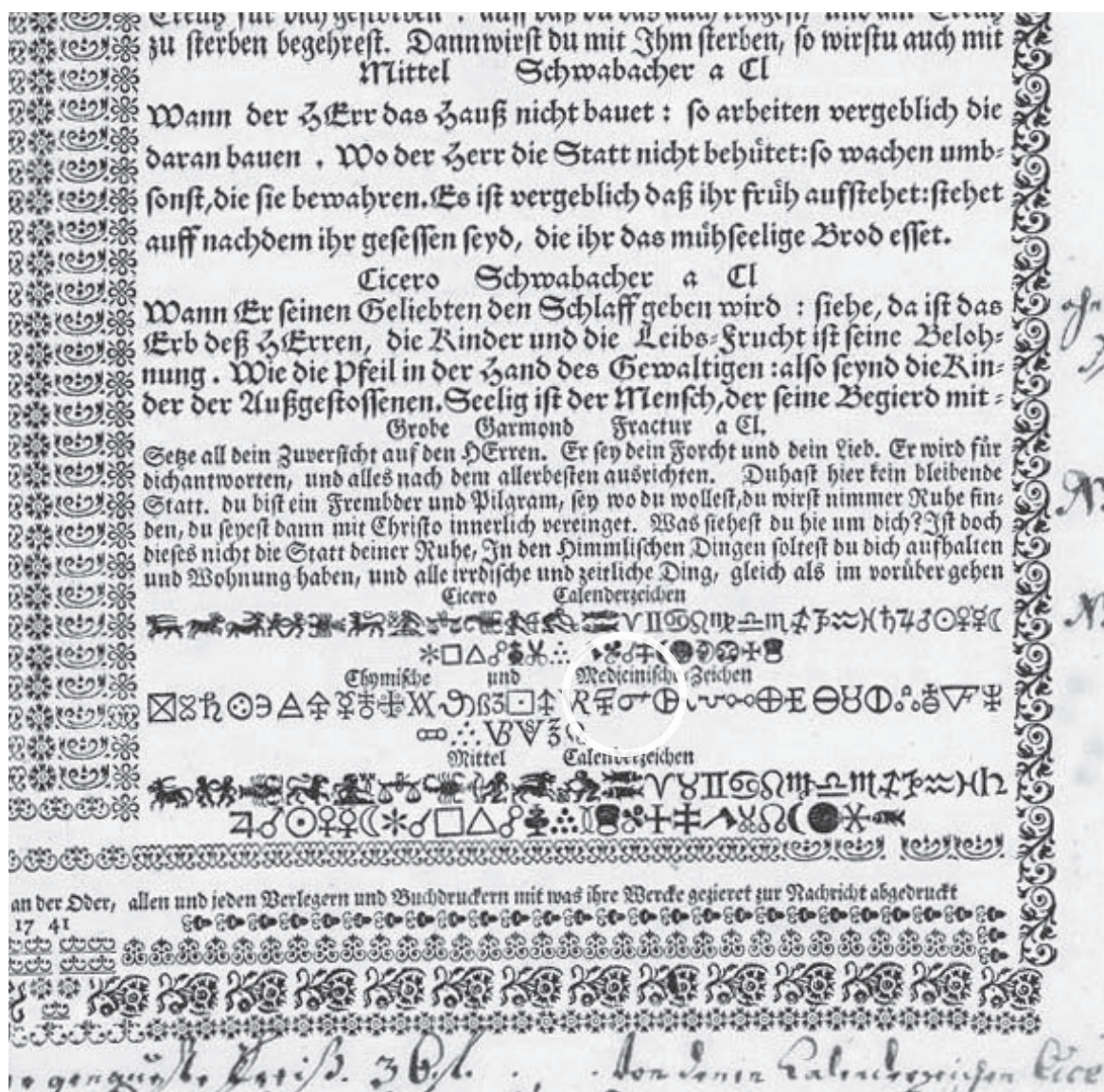
The square for foil is productive, being used for any malleable metal. One possibility would be U+20DE COMBINING ENCLOSING SQUARE, for ☽ (silver foil) and ⊙ (gold foil), and so on with ☾ (a variant of silver foil), ♃ (tin foil or old-style electrum foil), ☿ (old-style tin foil), ♀ (copper foil), ♂ (iron foil), and ☉ (old-style variant for gold foil). I haven't seen it with Saturn for lead foil. [Andron, some symbols random font fallbacks]

The square for foil is productive, being used for any malleable metal. One possibility would be U+20DE COMBINING ENCLOSING SQUARE, for ☽□ (silver foil) and ⊙□ (gold foil), and so on with ☾□ (a variant of silver foil), ♃□ (tin foil or old-style electrum foil), ☿□ (old-style tin foil), ♀□ (copper foil), ♂□ (iron foil), and ☉□ (old-style variant for gold foil). I haven't seen it with Saturn for lead foil. [Arial Unicode MS, symbols partly random font fallbacks]

decoding example: ♀□ = 2640 20DE

d) A test with various fonts chosen, set in MS Word. In all four test cases the OS picks missing glyphs in the selected font ramdomly out of other fonts, the result is an unreadable chaos.

These testings reveal that the use of 20DE in conjunction with planetary signs produce display faults of all kinds, in most cases. COMBINING ENCLOSING SQUARE is in most (or many) frequently used fonts either absent or implemented with wrong definitions, which cause the results depicted. The fact that a use of 20DE could be considered as 'smart encoding' from a more puristic or theoretical point of view, doesn't help any. Therefore we propose new codepoints for ⊙ and ☽.

♂⁺ ALCHEMICAL SYMBOL FOR RETORT-2

We propose a new codepoint for this alchemical symbol "retorte". The symbol 1F76D already exists with the meaning "retorte", but it has a considerably different glyph shape and it would be a violation of editorial principles to use it instead. Among the alchemical symbols already encoded there are a few precedents for the practice to admit several characters with homonymous definition. – LBr 79 fol. 90v (top, middle), 100r (below)

♂ ALCHEMICAL SYMBOL FOR RETORT-2

From a printer's specimen, by Philipp Glaser, Frankfurt/O., 1741.

Source: Universitätsbibliothek Frankfurt/M.

6. Unicode Character Properties

```
xe01;ALCHEMICAL INVERTED SYMBOL FOR OIL;So;0;ON;;;;;N;;;;;
xe02;ALCHEMICAL SYMBOL FOR MOON-JUPITER;So;0;ON;;;;;N;;;;;
xe03;ALCHEMICAL SYMBOL FOR TARTAR-SALT;So;0;ON;;;;;N;;;;;
xe04;ALCHEMICAL SYMBOL ENCLOSED SUN;So;0;ON;;;;;;N;;;;;
xe05;ALCHEMICAL SYMBOL ENCLOSED MOON;So;0;ON;;;;N;;;;;
xe06;ALCHEMICAL SYMBOL FOR RETORT-2;So;0;ON;;;;N;;;;;
```

"x" stands for *unspecified codespace*. "e" refers to our internal characters classification, see N5277.

7. Bibliography

LAA – refers to: Leibniz, Gottfried Wilhelm: Sämtliche Schriften und Briefe. ('Leibniz-Akademie-Ausgabe', many volumes)
LBr – refers to: Leibniz's original correspondence papers, GWLB Hanover
LH – refers to: Leibniz's original manuscripts, GWLB Hanover

[Ernesti, J. H. G.], Die wol-eingerichtete Buchdruckerey. Nürnberg, J. A. Endter Erben 1733 (Reprint: Radebeul 1940)
Geßmann, G. W.: Die Geheimsymbole der Alchymie, Arzneikunde und Astrologie des Mittelalters. Ulm 1964
Schneider, Wolfgang: Lexikon alchemistisch-pharmazeutischer Symbole. Weinheim/Bergstr. 1962
Weigel, Christian Ehrenfried: Grundriss der reinen und angewandten Chemie zum Gebrauch academischer Vorlesungen entworfen. Greifswald 1777

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]
Please fill all the sections A, B and C below.
Please read Principles and Procedures Document (P & P) from http://std.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for guidelines and details before filling this form.**
Please ensure you are using the latest Form from http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html.
See also http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest *Roadmaps*.**

A. Administrative

1. **Title:** **Proposal to add historic scientific characters to the UCS**
2. Requester's name: Uwe Mayer, Siegmund Probst, David Rabouin, Elisabeth Rinner, Andreas Stötzner, Achim Trunk, Charlotte Wahl
3. Requester type (Member body/Liaison/Individual contribution): Individual (work group)
4. Submission date: 2025-05.07.
5. Requester's reference (if applicable): LUCP L-2517
6. Choose one of the following:
   This is a complete proposal: Yes
   (or) More information will be provided later:

B. Technical – General

1. Choose one of the following:
   a. This proposal is for a new script (set of characters): No
      Proposed name of script:
   b. The proposal is for addition of character(s) to an existing block: Yes
      Name of the existing block: Alchemical Symbols [Extension]
2. Number of characters in proposal: 6
3. Proposed category (select one from below - see section 2.2 of P&P document):
   A-Contemporary   B.1-Specialized (small collection) Yes   B.2-Specialized (large collection)
   C-Major extinct   D-Attested extinct   E-Minor extinct
   F-Archaic Hieroglyphic or Ideographic   G-Obscure or questionable usage symbols
4. Is a repertoire including character names provided? Yes
   a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document? Yes
   b. Are the character shapes attached in a legible form suitable for review? Yes
5. Fonts related:
   a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard? Andreas Stötzner
   b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.): Andreas Stötzner Gestaltung, Klauflügelweg 21, 88400 Biberach/R., Germany, as@signographie.de
6. References:
   a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? Yes
   b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached? Yes
7. Special encoding issues:
   Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)? No

8. Additional Information:
Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see Unicode Character Database (http://www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? — Yes
   If YES explain — *L-2432 (L2/25-131)*

2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)? — Yes
   If YES, with whom? — Leibniz-Archiv, Forschungsstelle der Leibniz-Edition, Niedersächsische Landesbibliothek (GWLB), Hanover, Göttingen Academy of Science and Humanities in Lower Saxony (DE), Philiumm research group of CNRS (UMR 7219, laboratoire SPHERE) / Université de Paris VII; general: scholars, researchers, authors and editors working in the field of science history and upon editions of historic text corpora (e.g. of G. W. Leibniz, but also many others)
   If YES, available relevant documents: — L-2409, L-2410

3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? — Yes
   Reference:

4. The context of use for the proposed characters (type of use; common or rare) — Common
   Reference: — mainly specialist usage, scholarly, worldwide

5. Are the proposed characters in current use by the user community? — Yes
   If YES, where? Reference: — mainly Europe, Americas; other countries

6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? — No
   If YES, is a rationale provided?
   If YES, reference:

7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)? — No

8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? — Yes
   If YES, is a rationale for its inclusion provided? — Yes
   If YES, reference: — *see explanations on p. 12–13*

9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? — Yes
   If YES, is a rationale for its inclusion provided? — *Yes*
   If YES, reference: — *see explanations on p. 8–11*

10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to, or could be confused with, an existing character? — No
    If YES, is a rationale for its inclusion provided?
    If YES, reference:

11. Does the proposal include use of combining characters and/or use of composite sequences? — No
    If YES, is a rationale for such use provided?
    If YES, reference:
    Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided? — No
    If YES, reference:

12. Does the proposal contain characters with any special properties such as control function or similar semantics? — No
    If YES, describe in detail (include attachment if necessary)

13. Does the proposal contain any Ideographic compatibility characters? — No
    If YES, are the equivalent corresponding unified ideographic characters identified?
    If YES, reference: