ISO/IEC JTC 1/SC 2 N 4540
ISO/IEC JTC 1/SC 2/WG2 N 4830

ISO/IEC JTC 1/SC 2
Coded character sets
Secretariat: JISC (Japan)

Document type:
Title: Proposal on 3 China's UNCs for Chemical Terminology to ISO/IEC 10646
Status:
Date of document: 2017-07-26
Source: China
Expected action: Consideration for acceptance of ISO/IEC 10646
Action due date:
No. of pages: 1
Attachment: IRGN2198
Email of secretary: kimura@itscj.ipsj.or.jp
Committee URL: http://isotc.iso.org/livelink/livelink/open/jtc1sc2

This document proposes 3 CJK Unified Ideographs to be encoded in URO of ISO/IEC 10646.

The 3 characters were created for the Chinese names of Element 113 (Nihonium, Nh), Element 117 (Tennessine, Ts) and Element 118 (Oganesson, Og), in April 2017. They are considered urgently needed characters (UNC) because they are being used not only in the field of sciences, but also in teaching materials (such as the Periodic Table of Chemical Elements) for around 83+ million middle school students and 36+ million college students.

The 3 characters were submitted to IRG#48 (see IRGN2198). As recommended by IRG (Recommendation IRG M48.9), the document is submitted for consideration. For details of the proposal, see attachment please.

Attachment:
IRGN2198 Proposal on 3 China's UNCs for Chemical Terminology to URO+

Universal Multiple‐Octet Coded Character Set UCS

ISO/IEC JTC1/SC2/WG2/IRG N2198
Date: 2017-05-05

Source:	China
Title:	Proposal on 3 China's UNCs for Chemical Terminology to URO+
Meeting:	IRG #48, Bundang, Gyeonggi-do, Republic of Korea
Status:	Member's submission
Actions required:	To be considered by IRG
Distribution:	IRG
Medium:	Electronic
Page:	12
Appendix:	Attributes (in an excel file)

1. Introduction

On 28th November 2016, the International Union of Pure and Applied Chemistry (IUPAC) approved the name and symbols for four elements: nihonium (Nh), moscovium (Mc), tennessine (Ts), and oganesson (Og), respectively for Elements 113, 115, 117, and 118.

The following names and symbols are officially assigned:

Nihonium and symbol Nh, for the Element 113,

Moscovium and symbol Mc, for the Element 115,

Tennessine and symbol Ts, for the Element 117,

Oganesson and symbol Og, for the Element 118.

On 15th February 2017, the China National Committee for Terms in Sciences and Technologies and the China National Language and Character Working Committee jointly organized the naming meeting of Elements 113, 115, 117, and 118. Through the discussion of chemists, physical scientists and linguists, the Chinese names of Elements 113, 115, 117, and 118 were definitely settled down. (Please see Table 1.)

Table 1 Chinese Names of Elements 113, 115, 117, and 118

Atomic Number	English Names	Chinese Names	Symbols	Pinyin	Traditional Forms
113	nihonium	钅尼	Nh	nǐ	鈤
115	moscovium	镆	Mc	mò	鏌
117	tennessine	砬	Ts	tián	砬
118	oganesson	氪	Og	kào	氪

No.2, Vol. 19 of the magazine China Terminology host by the China National Committee for

Terms in Sciences and Technologies showed the four Chinese names of new elements have approved to use as general purpose normalized Hanzi by the China National Language and Character Working Committee. (Please see Fig. 1.)

On 5th April 2017, the Chemical Terminology Translation Committee of the Academy for Educational Research in Taiwan area approved the new version of the List of Chemical Terms and Chemical Elements in their website. (Please see Fig. 2) This version has included the Chinese names of the four new elements.

By checking against the latest version of ISO/IEC 10646 and CJK Ext F (aka IRGN2156), we found 3 characters not encoded. One is in WS2015, which was submitted by UTC, other two are never proposed. Now China requests to IRG to process all the 3 characters as UNCs and include them in URO+. We plan to add a new Hanzi G source: GCE at this time.

Special note is that the traditional forms of GCE-113 are 鈥 (according to Fig. 1 and Fig. 53 in IRGN2091) and 鑭 (according to Fig. 3), but the only traditional form for the Chemistry Element is 鈰. UTC has submitted UTC-01119 in WS2015, which is the same with GCE-113, so we suggest IRG should make UTC-01119 be unified with GCE-113.

The new code chart we suggest like this:

Table 2 Part of the Code Chart

HEX	C	J	K	V
9FEB 气 84.12	氪 GCE-118			
9FEC 石 112.5	砼 GCE-117			
9FED 钅 167'.5	钪 钪 GCE-113 UTC-01119			

This China urgently-needed character submission consists of the following documents:

IRGN2198A:	This document
IRGN2198B:	Proposal summary form to accompany submissions
IRGN2198C:	Appendix 1: An Excel spreadsheet with character attributes
IRGN2198D:	Appendix 2: A zip archive of glyphs' bitmaps
IRGN2198E:	Appendix 3: Four evidences of all the characters
IRGN2198F:	Appendix 4: A font containing glyphs for all the characters

Chinese Characters Repertoire offered help to China National Committee for Terms in Sciences and Technologies for checking the characters and submitting this proposal.

2. Proposed Characters

Table 3 Three Proposed Characters as UNCs

G-Source Code	GCE-113	GCE-117	GCE-118
Proposed Code Point	U+9FED	U+9FEC	U+9FEB
PUA	U+E000	U+E001	U+E002
Glyph	钶	硆	氭
IDS	⿰钅尔 U+2FF0,U+9485,U+5C14	⿰石田 U+2FF0,U+77F3,U+7530	⿰气奥 U+2FF9,U+6C14,U+5965
Radical	167'	112	84
Radical Form	钅	石	气
Strokes	5	5	12
Total Strokes	10	10	16
First Stroke	3	2	3
KX Index	167'.5	112.5	84.12
Putonghua Pronunciation	nǐ,xǐ,niè	tián	ào
Cantonese Pronunciation	nei5,saai2,nip6	tin4	ou3
T/S	1	0	0
Simplified Form	SC	N/A	N/A
Traditional Form	鈉 & 鋼	N/A	N/A
Code Point for Traditional Form	U+9268 & U+9448	N/A	N/A

3. Unicode Properties

```
9FEB;CJK UNIFIED IDEOGRAPH-9FEB;Lo;0;L;;;;;N;;;;;
9FEC;CJK UNIFIED IDEOGRAPH-9FEC;Lo;0;L;;;;;N;;;;;
9FED;CJK UNIFIED IDEOGRAPH-9FED;Lo;0;L;;;;;N;;;;;
```

Other properties are the same as for other CJK Unified Ideographs.

4. The New Hanzi G Source

GCE Chemistry Elements (化学元素中文用字)

The numbers behind “GCE-” mean the atomic number.

5. Evidences

Fig. 1 全国科学技术名词审定委员会 (China National Committee for Terms in Sciences and Technologies): 《全国科学技术名词审定委员会公布 113 号、115 号、117 号、118 号元素中文名称》(China National Committee for Terms in Sciences and Technologies Published the Chinese Names of Elements 113, 115, 117, 118), 《中国科技术语》(China Terminology), 2017.04., No.2, Vol. 19, ISSN 1673-8578 CN 11-5554/N, P. 25

全国科学技术名词审定委员会
公布 113 号、115 号、117 号、118 号元素的中文名称

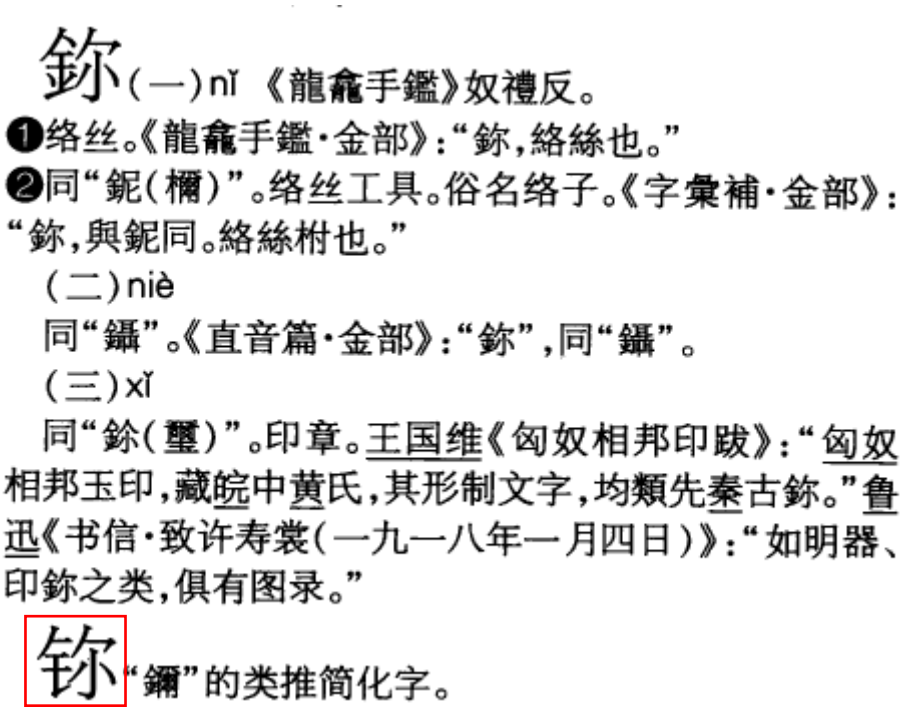
全国科学技术名词审定委员会根据国际纯粹与应用化学联合会(IUPAC)2016 年 11 月 30 日对 113 号、115 号、117 号、118 号元素正式公布的英文名称,在广泛征求有关专家意见的基础上,提出了 113 号、115 号、117 号、118 号元素的中文定名草案。113 号、115 号、117 号、118 号元素使用的中文汉字“鉨”“镆”“𬬭”“氪”已征得国家语言文字工作委员会的同意,并纳入国家规范用字。现经全国科学技术名词审定委员会批准予以公布使用。

原子序数	英文名称	中文名称	符号	汉语拼音
113	nihonium	鉨	Nh	nǐ
115	moscovium	镆	Mc	mò
117	tennessine	𬬭	Ts	tián
118	oganesson	氪	Og	ào

Fig. 2 Chemical Terminology Translation Committee of Academy for Educational Research (Taiwan): List of Chemical Terms and Chemical Elements, 2017.04.05
http://terms.naer.edu.tw/terms/manager_admin/new_file_download.php?Pact=FileDownLoad&button_num=g1&source_id=84&Pval=1932

nihonium	鉨	113	Nh	ㄋㄧˇ	你
moscovium	鏌	115	Mc	ㄇㄛˋ	莫
tennessine	【石+田】	117	Ts	ㄊㄧㄢˊ	田
oganesson	【气+奥】	118	Og	ㄠˋ	澳

Fig. 3 汉语大字典编辑委员会 (Hànyǔ Dàzìdiǎn Biānjí Wěiyuánhuì): 《汉语大字典（第二版）》 (Hànyǔ Dàzìdiǎn V2), 武汉: 湖北长江出版集团崇文书局 (Wǔhàn: Chongwen Publishing House of Hubei Changjiang Publishing Group) & 成都: 四川出版集团四川辞书出版社 (Chéngdū: Sichuan Reference Press of Sichuan Publishing Group), 2010, ISBN 978-7-5403-1744-7, P. 4509



鈤(一)nǐ《龍龕手鑑》奴禮反。

❶络丝。《龍龕手鑑·金部》:“鈤,絡絲也。”

❷同“鈮(檷)”。络丝工具。俗名络子。《字彙補·金部》:“鈤,與鈮同。絡絲柎也。”

(二)niè

同“鑷”。《直音篇·金部》:“鈤”,同“鑷”。

(三)xǐ

同“鉨(璽)”。印章。王国维《匈奴相邦印跋》:“匈奴相邦玉印,藏皖中黄氏,其形制文字,均類先秦古鈤。”鲁迅《书信·致许寿裳(一九一八年一月四日)》:“如明器、印鈤之类,俱有图录。”

钤“鑷”的类推简化字。

6. Proposed Unihan Data for Some Ideographs for Chemical Terminology

6.1 Proposed Unihan Data for GCE-113

钕

Data Type	Value
IRG Sources	
kIRG_GSource	GCE-113
kIRG_USource	UTC-01119
Dictionary-like Data	
kTotalStrokes	10
Radical-stroke Indices	
kRSKangXi	167'.5
kRSUnicode	167'.5
Readings	
kCantonese	nei5,saai2,nip6
kDefinition	nihonium
kMandarin	nǐ,xǐ,niè
kXHC1983	1235.060:xǐ
Variants	
kTraditionalVariant	U+9268 鈰,U+9448 鑭

6.2 Proposed Unihan Data for GCE-117

Data Type	Value
IRG Sources	
kIRG_GSource	GCE-117
Dictionary-like Data	
kTotalStrokes	10
Radical-stroke Indices	
kRSKangXi	112.5
kRSUnicode	112.5
Readings	
kCantonese	tin4
kDefinition	tennessine
kMandarin	tián

6.3 Proposed Unihan Data for GCE-118

Data Type	Value
IRG Sources	
kIRG_GSource	GCE-118
Dictionary-like Data	
kTotalStrokes	16
Radical-stroke Indices	
kRSKangXi	84.12
kRSUnicode	84.12
Readings	
kCantonese	ou3
kDefinition	oganesson
kMandarin	ào

6.4 Proposed Changes to kDefinition & kSimplifiedVariant value for U+9268

Data Type	Value
Readings	
kDefinition	nihonium
Variants	
kSimplifiedVariant	U+9FED 钬

ISO/IEC JTC 1/SC 2/WG 2/IRG

PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS

FOR ADDITION OF CJK UNIFIED IDEOGRAPHS TO THE REPERTOIRE OF ISO/IEC 10646

Submitters are reminded to:

1.Fill in all the sections below.

2. Read the Principles and Procedures Document (P & P) available at

http://appsrv.cse.cuhk.edu.hk/~irg/irg/irg45/IRGN2092PnPv8.pdf

for guidelines and details before filling in this form.

3. Use the latest Form from

http://appsrv.cse.cuhk.edu.hk/~irg/irg/irg45/IRGN2092PnP_BlankDataFile.xls

See also http://appsrv.cse.cuhk.edu.hk/~irg/irgwds.html **for the latest *Unifiable Component Variations*.**

A. Administrative

1. **IRG Project Code:**	IRGN2198
2. **Title:**	China's Proposal on 3 China's UNCs for Chemical Terminology to IRG #48
3. Submitter's Region/Country Name:	China
4. Submitter Type (National Body/Individual Contribution):	Member body
5. Submission Date:	2017-05-05
6. Requested Ideograph Type (Unified or Compatibility Ideographs)	Unified Ideographs
If Compatibility, does the submitter have the intention to register them as IVS (See UTS #37) with the IRG's approval? (Registration fee will not be charged if authorized by the IRG.)	No
7. Proposal Type (Normal Proposal or Urgently Needed)	Urgently Needed
8. Choose one of the following:	
This is a complete proposal	Yes
(or) More information will be provided later.	

B. Technical – General

1. Number of ideographs in the proposal:	*3*
2. Glyph format of the proposed ideographs: (128x128 Bitmap files or TrueType font file)	*Both*
If Bitmap files, are their file names the same as their source references?	*Yes*
If TrueType font file, are all the proposed glyphs put into BMP PUA area?	*Yes*
If TrueType font file, are data for source references vs. character codes provided?	*Yes*
3. Source references:	
Do all the proposed ideographs have a unique, proper source reference (member body/international consortium abbreviation followed by no more than 9 alphanumeric characters)?	Yes
4. Evidence:	
a. Do all the proposed ideographs have a separate evidence document which contains at least one scanned image of printed materials (preferably dictionaries)?	Yes
b. Do all the printed materials used for evidence provide enough information to track them by a third party (ISBN numbers, etc.)?	Yes
5. Attribute Data Format: (Excel file or CSV text)	*Excel*

C. Technical - Checklist

Understanding of the Unification Principles	
1. Has the submitter read ISO/IEC 10646 Annex S and does the submitter understand the unification principles?	*Yes*
2. Has the submitter read the "Unifiable Component Variations" (contact the IRG technical editor through the IRG Rapporteur for the latest version) and does the submitter understand the unifiable variation examples?	*Yes*
3. Has the submitter read the IRG PnP document and does the submitter understand the 5% Rule?	*Yes*
Character-Glyph Duplication (http://www.itscj.ipsj.or.jp/sc2/open/pow.htm contains all the published ones and those under ballot**)**	
4. Has the submitter checked that the proposed ideographs are ***not unifiable*** with any of the unified or compatibility ideographs of the latest version of ISO/IEC 10646?	*Yes*
If the checking has been done against an earlier version of ISO/IEC 10646, please specify the version? (e.g. 10646:2012)	ISO/IEC 10646:2014(E)
5. Has the submitter checked that the proposed ideographs are ***not unifiable*** with any of the ideographs in the amendments, if any, of the latest version of ISO/IEC 10646?	*Yes*
If yes, which amendment(s) has the submitter checked?	
6. Has the submitter checked that the proposed ideographs are ***not unifiable*** with any of the ideographs in the proposed amendments, if any, of ISO/IEC 10646?	*Yes*
If yes, which draft amendment(s) has the submitter checked?	
7. Has the submitter checked that the proposed ideographs are ***not unifiable*** with any of the ideographs in the current working M-set and D-set of the IRG? (Contact IRG chief editor and technical editor through the IRG Rapporteur for the newest list)	*Yes*
If yes, which document(s) has the submitter checked?	WS2015
8. Has the submitter checked that the proposed ideographs are ***not unifiable*** with any of the over-unified or mis-unified ideographs in ISO/IEC 10646? (See Annex E of the IRG PnP document).	*Yes*
9. Has the submitter checked whether the proposed ideographs have any ***similar ideographs*** in the current standardized or working sets mentioned above?	*Yes*
10. Has the submitter checked whether the proposed ideographs have any ***variant ideographs*** in the current standardized or working sets mentioned above?	*Yes*
Attribute Data	
11. Do all the proposed ideographs have attribute data such as the Kangxi radical code and stroke count?	*Yes*
12. Are there any simplified ideographs (ideographs that are based on the policy described in 簡化字總表) among the proposed ideographs?	*Yes*
If yes, does the proposal include proper simplified/traditional indication flag for each proposed ideograph in the attribute data?	*Yes*
13. Do all the proposed ideographs have the document page number of evidence documents in the attribute data?	*Yes*
14. Do all the proposed ideographs have the proper Ideographic Description Sequence (IDS) in the attribute data?	*Yes*
If no, how many proposed ideographs do not have the IDS?	
15. If the answer to question 9 or 10 is yes, do the attribute data include any information on similar/variant ideographs for the proposed ideographs?	*Yes*
16. Do all the proposed ideographs contains the total stroke count(kTotalStrokes)[1]?	*Yes*

[1] The IRG understands that kTotalStrokes can be ambiguous and subject to different interpretations. The IRG takes no responsibility to check the correctness of the submitted attribute data.