

## Systematic naming of Elements with Atomic Numbers Greater than 110

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Elements of atomic numbers greater than 110 are often referred to in the scientific literature but receive names **only after they have been 'discovered'**. Names are needed for indexing and other purposes and the Commission on Nomenclature of Inorganic Chemistry was asked to make recommendations concerning names and symbols of the **heavy 'unknown' elements**. The Commission decided that these elements would be best named systematically and that names should accord with the following principles:

- (i) The names should be **short** and obviously **related to the atomic numbers** of the elements.
- (ii) The names should end in **'ium'** whether the element was expected to be a metal or otherwise.
- (iii) The symbols for the systematically named elements should consist of **three letters**.
- (iv) The symbols should be derived directly from the atomic numbers and be **visually related to the names** as far as possible.

The reasons for principles (i), (ii), and (iv) are obvious but those for (iii) are not so immediately apparent. The Commission recommends the use of three-letter symbols because any systematically derived set of two-letter symbols will tend to duplicate some of the two-letter symbols of elements of atomic numbers less than 110. Any ad hoc method of removing such duplication will destroy the systematic derivation of the symbol.

**The existence of a systematic nomenclature for the unknown elements does not deny the right of 'discoverers' of new elements to suggest other names to the Commission after their discovery has been established beyond all doubt in the general scientific community.**

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### Nomenclature of Elements of Atomic Numbers greater than 110

**1.** The name is derived directly from the atomic number of the element using the following numerical roots:

0 = <b>nil</b>	5 = <b>pent</b>
1 = <b>un</b>	6 = <b>hex</b>
2 = <b>bi</b>	7 = <b>sept</b>
3 = <b>tri</b>	8 = <b>oct</b>
4 = <b>quad</b>	9 = <b>enn</b>

**2.** The roots are put together in the order of the digits which make up the atomic number and terminated by **'ium'** to spell out the name. The final 'n' of 'enn' is elided when it occurs before 'nil', and the final 'i' of 'bi' and of 'tri' when it occurs before 'ium'.

**3.** The symbol of the element is composed of the initial letters of the numerical roots which make up the name.

**4.** The root 'un' is pronounced with a long 'u', to rhyme with 'moon'. In the element names each root is to

be pronounced separately.



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Dim LA(0 To 9) As String: Dim Za As String : Dim en As String : Dim sy As String
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Private Sub NAMING()
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elenam$ = "": wsx = 0: anf$ = "": supos = 0  
myLen = 0: LA(0) = "nil": LA(1) = "un": LA(2) = "bi": LA(3) = "tri": LA(4) = "quad":  
LA(5) = "pent": LA(6) = "hex": LA(7) = "sept": LA(8) = "oct": LA(9) = "enn":
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Za$ = LTrim$(InputBox(" Please insert atomic number > 110 ", ""))  
myLen = Len(Za$)
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For bs = 1 To myLen  
wsx = Val(Mid(Za$, bs, 1))  
If bs = 1 Then  
anf$ = UCase(Left(LA(wsx), 1)): elenam$ = anf$ + Mid(LA(wsx), 2, myLen): sy$ = anf$  
Else  
elenam$ = elenam$ + LA(wsx)  
sy$ = sy$ + Left(LA(wsx), 1)  
End If  
Next  
If Right(elenam$, 1) = "i" Then  
elenam$ = elenam$ + "um"  
Else  
elenam$ = elenam$ + "ium"  
End If  
supos = InStr(1, elenam$, "nnn"):  
If supos > 0 Then elenam$ = Left(elenam$, supos - 1) + Mid(elenam$, supos + 1)  
sy$ = " [ " + sy$ + " ]"  
en$ = elenam$  
MsgBox Za$ + " " + en$ + " " + sy$
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End Sub
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## Atomic number Name Symbol

101 Mendeleevium (Unnilunium, Unu ) Md  
102 Nobelium (Unnilbium, Unb ) No  
103 Lawrencium (Unniltrium, Unt ) Lr  
104 Rutherfordium ( Unnilquadium, Unq ) Rf  
105 Dubnium ( Unnilpentium, Unp ) Db  
106 Seaborgium ( Unnilhexium, Unh ) Sg  
107 Bohrium (Unnilseptium, Uns ) Bh  
108 Hassium ( Unniloctium, Uno ) Hs  
109 Meitnerium ( Unnilennium, Une) Mt  
110 Darmstadtium ( Ununnilium, Uun) Ds

111 Unununium Uuu  
112 Ununbium Uub  
113 Ununtrium Uut  
114 Ununquadium Uuq  
115 Ununpentium Uup  
116 Ununhexium Uuh  
117 Ununseptium Uus  
118 Ununoctium Uuo  
119 Ununennium Uue  
120 Unbinilium Ubn  
121 Unbiunium Ubu

130 Untrinilium Utn  
140 Unquadnilium Uqn  
150 Unpentnilium Upn  
160 Unhexnilium Uhn  
170 Unseptnilium Usn  
180 Unoctnilium Uon  
190 Unennilium Uen

200 Binilnilium Bnn  
201 Binilunium Bnu  
202 Binilbium Bnb  
224 Bibiquadium Bbq

300 Trinilnilium Tnn  
400 Quadnilnilium Qnn  
500 Pentnilnilium Pnn

900 Ennilnilium Enn

