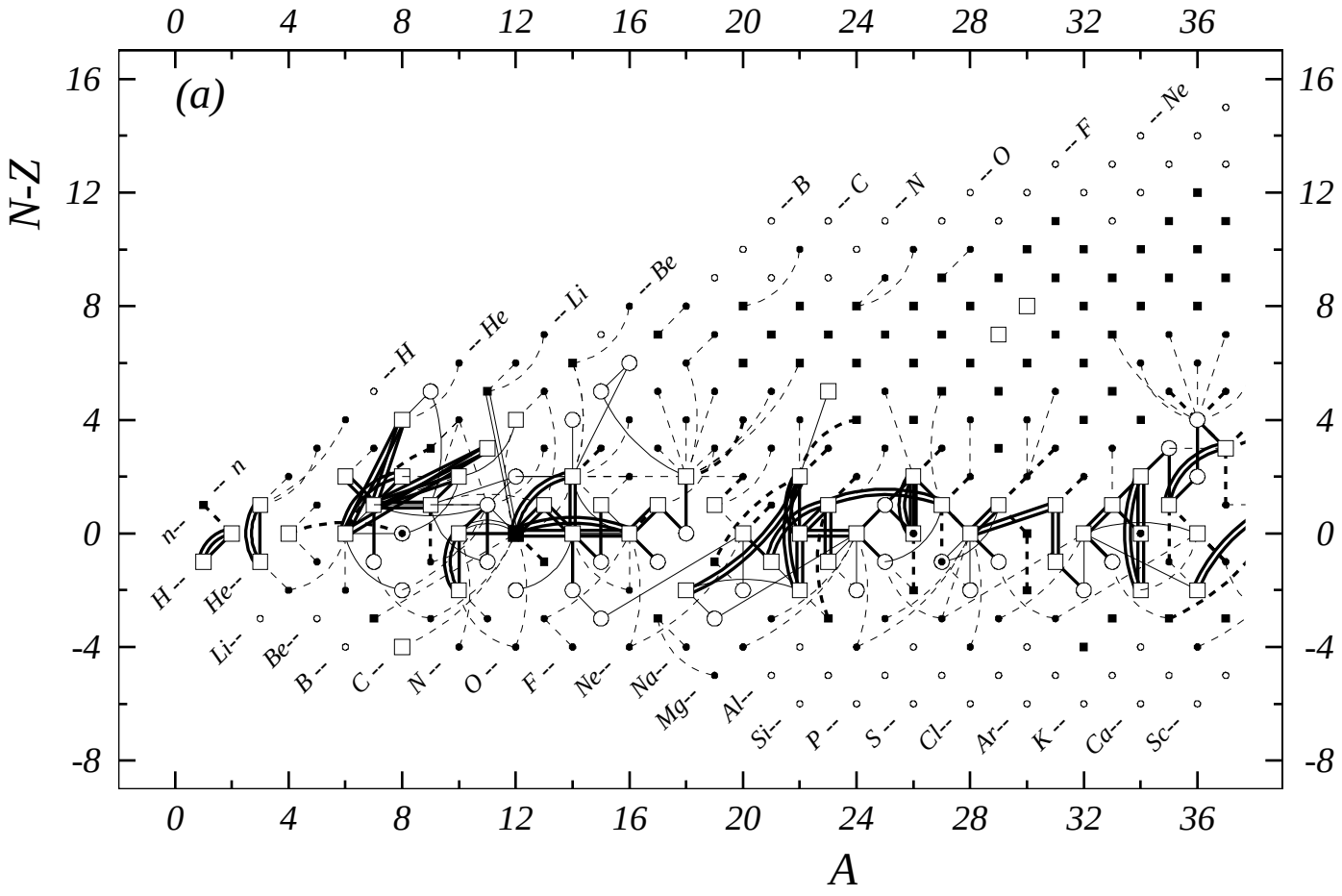
(a)
N-Z
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0
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8
12
16
20
24
28
32
36
16
12
8
4
0
-4
-8
n
H
He
Li
Be
B
C
N
O
F
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Na
Mg
Al
Si
P
S
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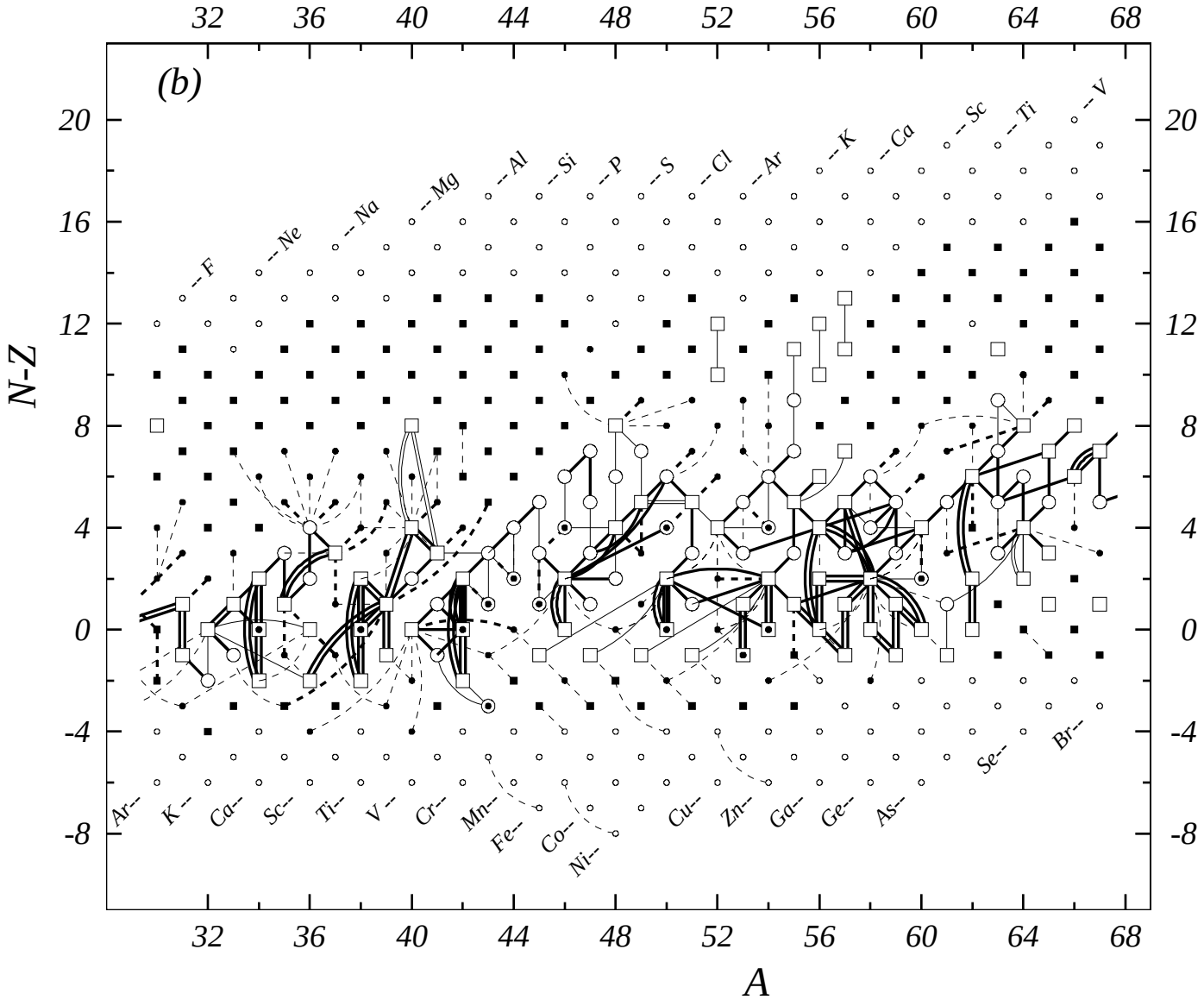
Ar
K
Ca
Sc


(b)
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48
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56
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64
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20
16
12
8
4
0
-4
-8
F
Ne
Na
Mg
Al
Si
P
S
Cl
Ar
K
Ca
Sc
Ti
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Sc
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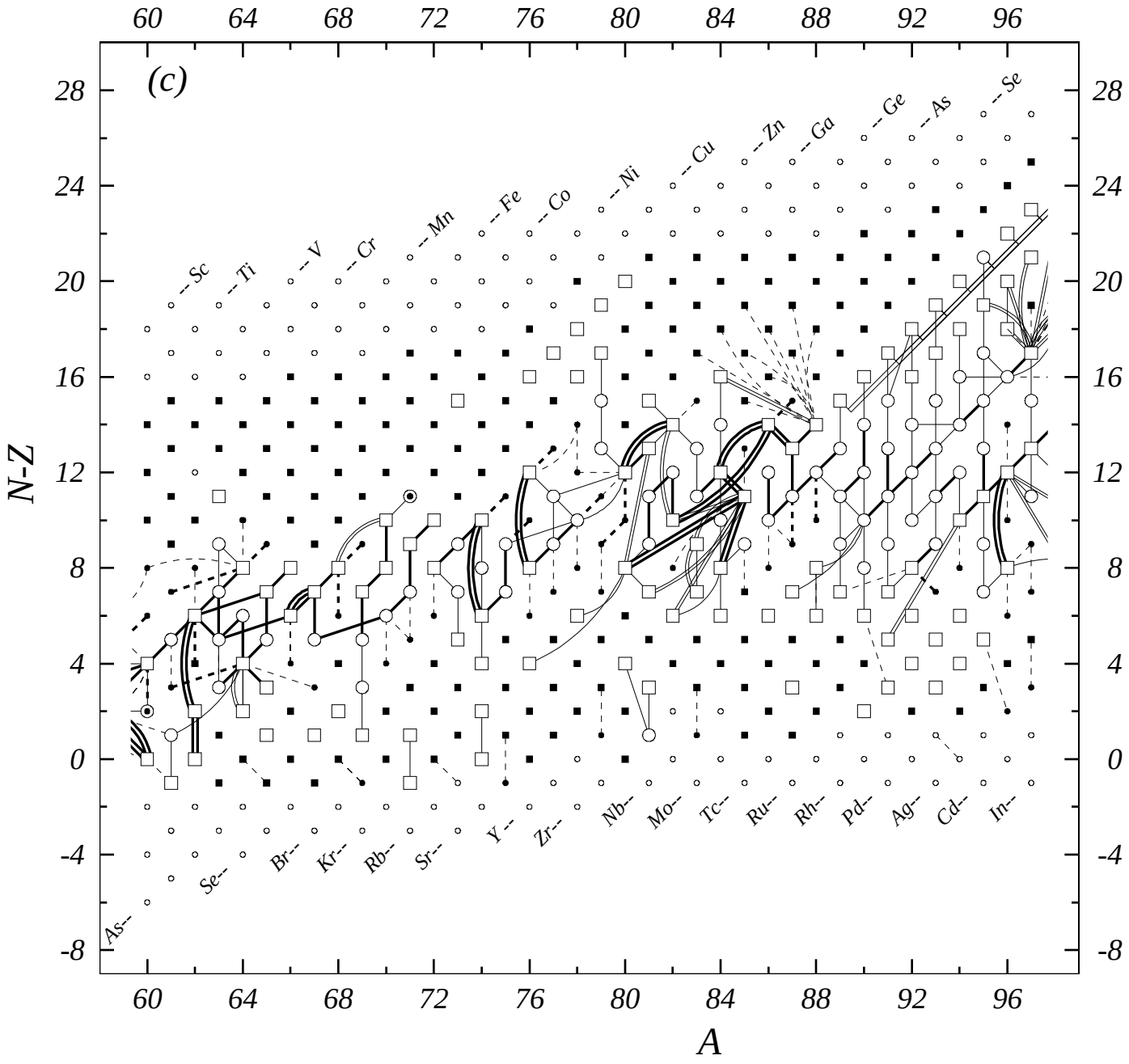
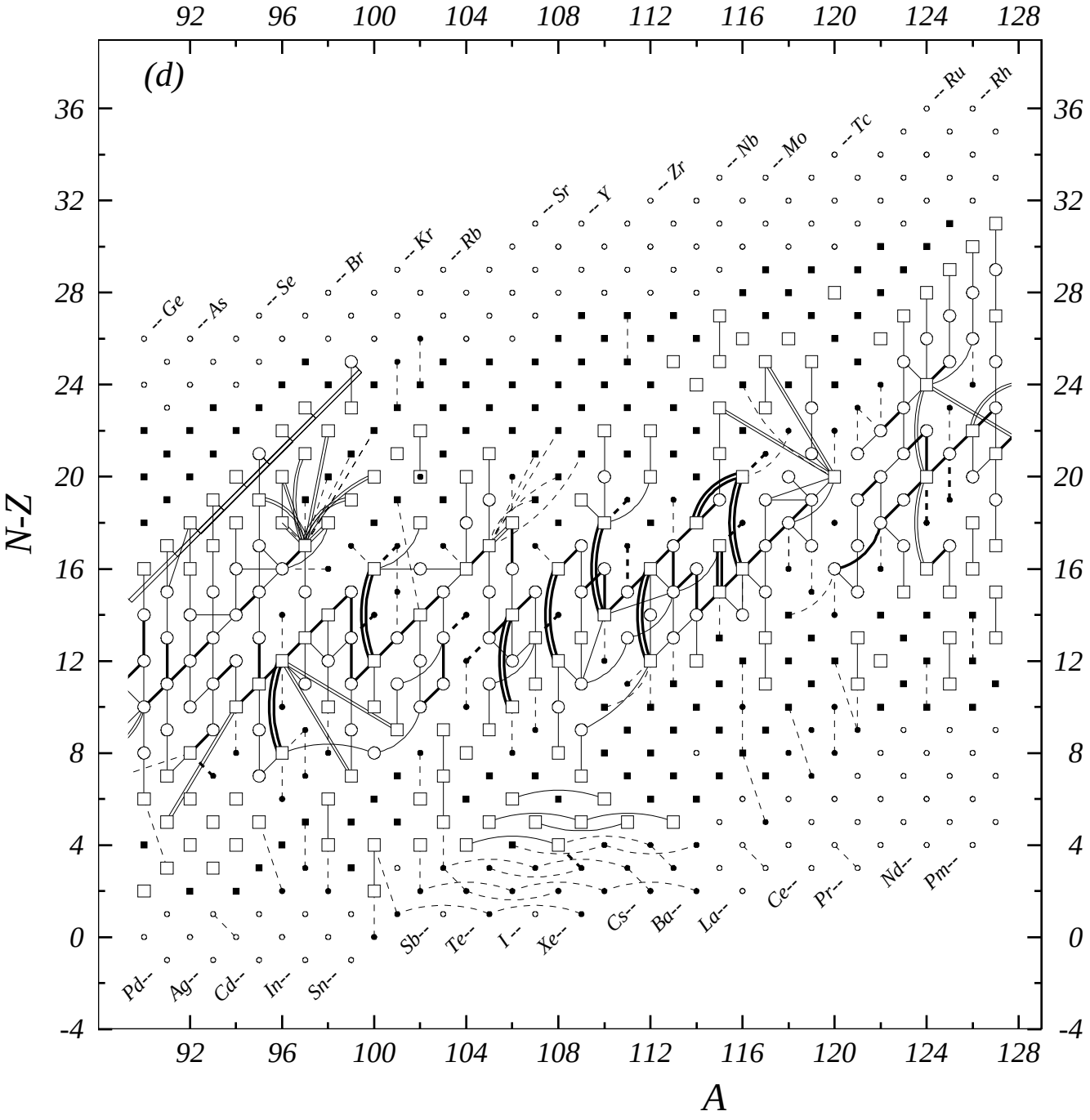
Co
Ni
Cu
Zn
Ga
Ge
As
Se
Br


(c)
N-Z
A
Sc
Ti
V
Cr
Mn
Fe
Co
Ni
Cu
Zn
Ga
Ge
As
Se
As--
Se--
Br--
Kr--
Rb--
Sr--
Y--
Zr--
Nb--
Mo--
Tc--
Ru--
Rh--
Pd--
Ag--
Cd--
In--


(d)
N-Z
A
92
96
100
104
108
112
116
120
124
128
36
32
28
24
20
16
12
8
4
0
-4
Ge
As
Se
Br
Kr
Rb
Sr
Y
Zr
Nb
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Cd
In
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Sb
Te
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Xe
Cs
Ba
La
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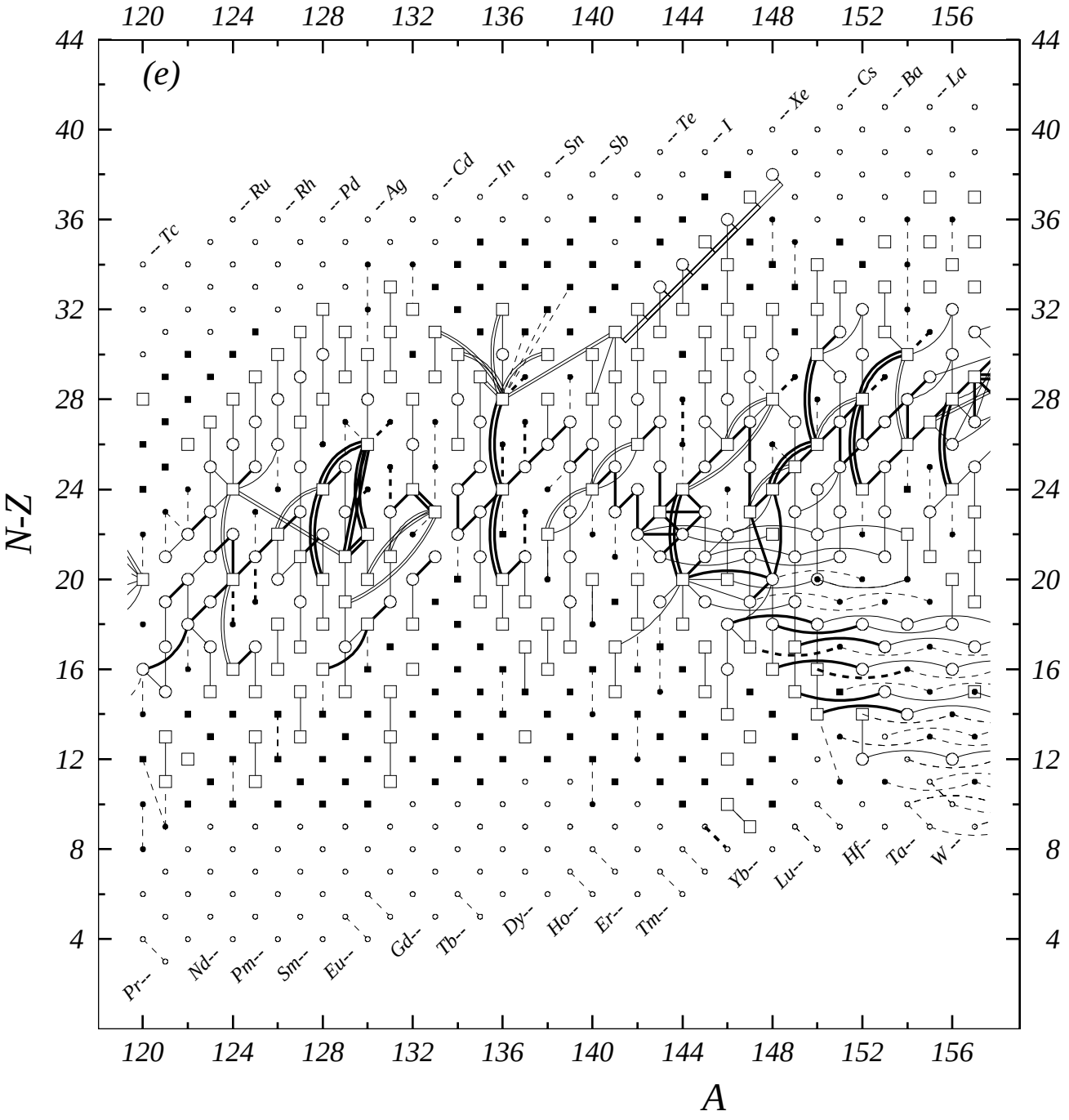
Pr
Nd
Pm


(e)
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24
28
32
36
40
44
Tc
Ru
Rh
Pd
Ag
Cd
In
Sn
Sb
Te
I
Xe
Cs
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Sm
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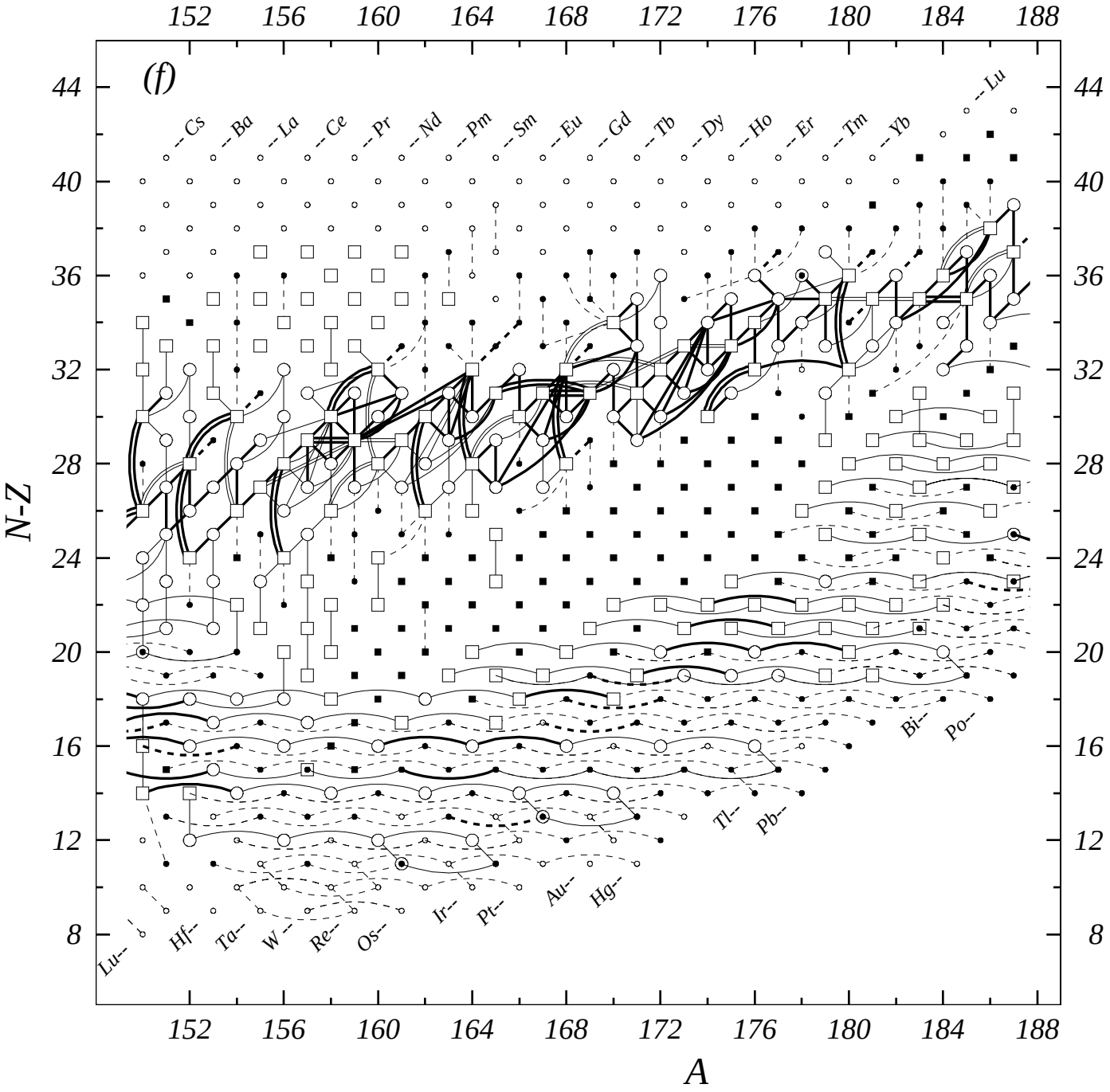
Gd
Tb
Dy
Ho
Er
Tm
Yb
Lu
Hf
Ta
W


(f)
Cs
Ba
La
Ce
Pr
Nd
Pm
Sm
Eu
Gd
Tb
Dy
Ho
Er
Tm
Yb
Lu
Lu--
Hf--
Ta--
W--
Re--
Os--
Ir--
Pt--
Au--
Hg--
Tl--
Pb--
Bi--
Po--
N-Z
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172
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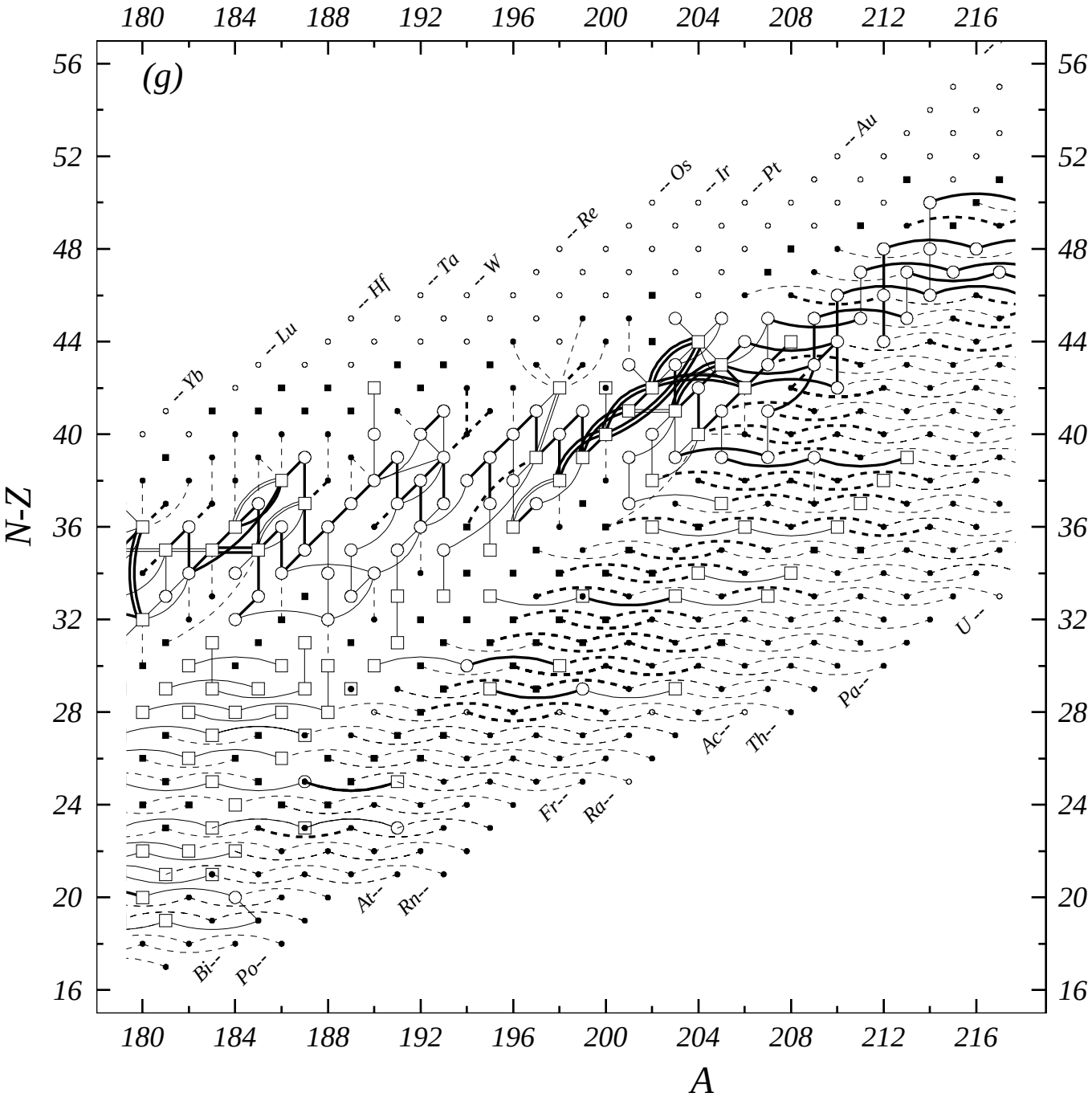
(g)
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40
44
48
52
56
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Hf
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Ir
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Po
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Rn
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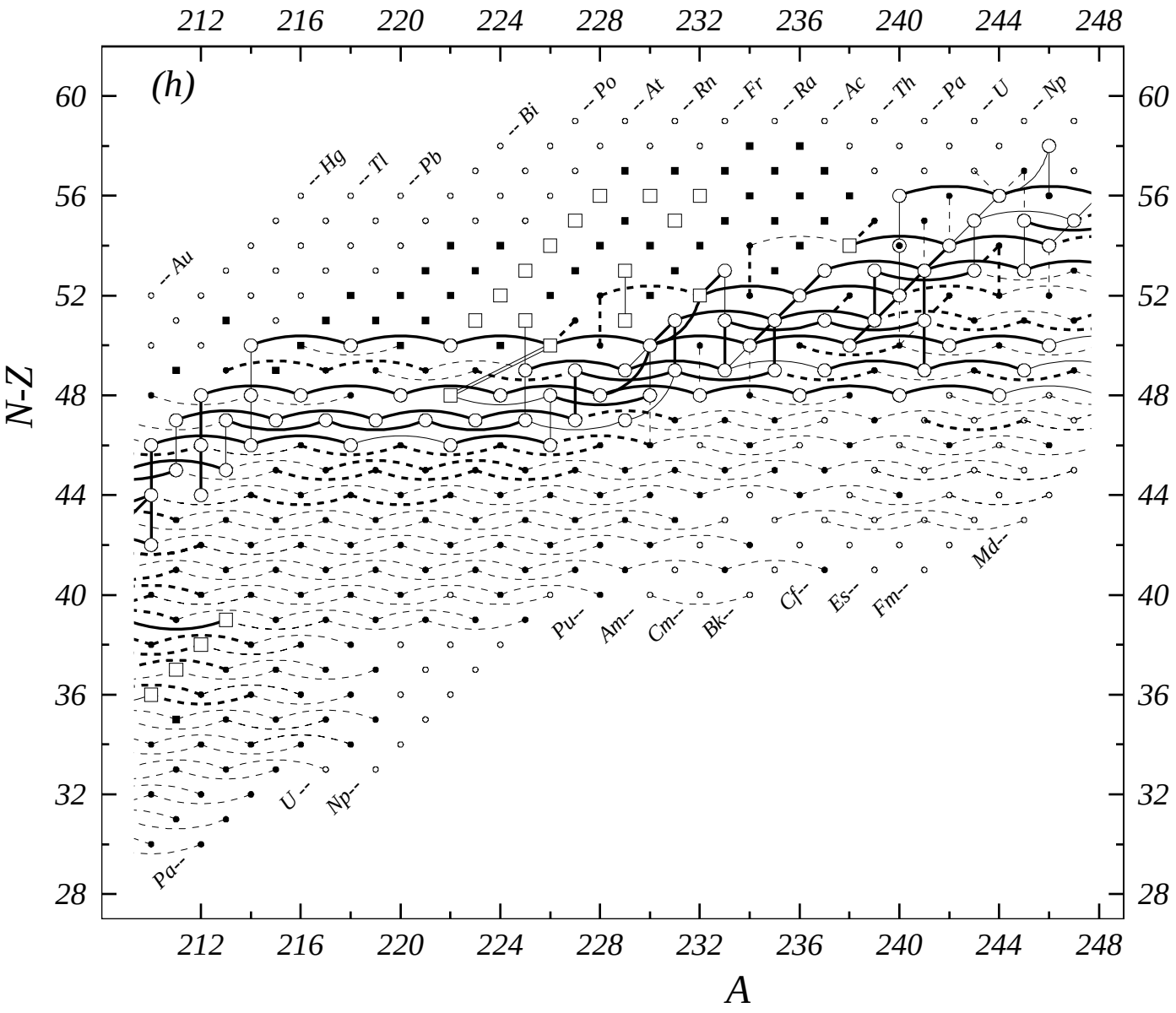
Ra
Ac
Th
Pa
U


(h)
N-Z
A
212
216
220
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228
232
236
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244
248
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32
36
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44
48
52
56
60
Au
Hg
Tl
Pb
Bi
Po
At
Rn
Fr
Ra
Ac
Th
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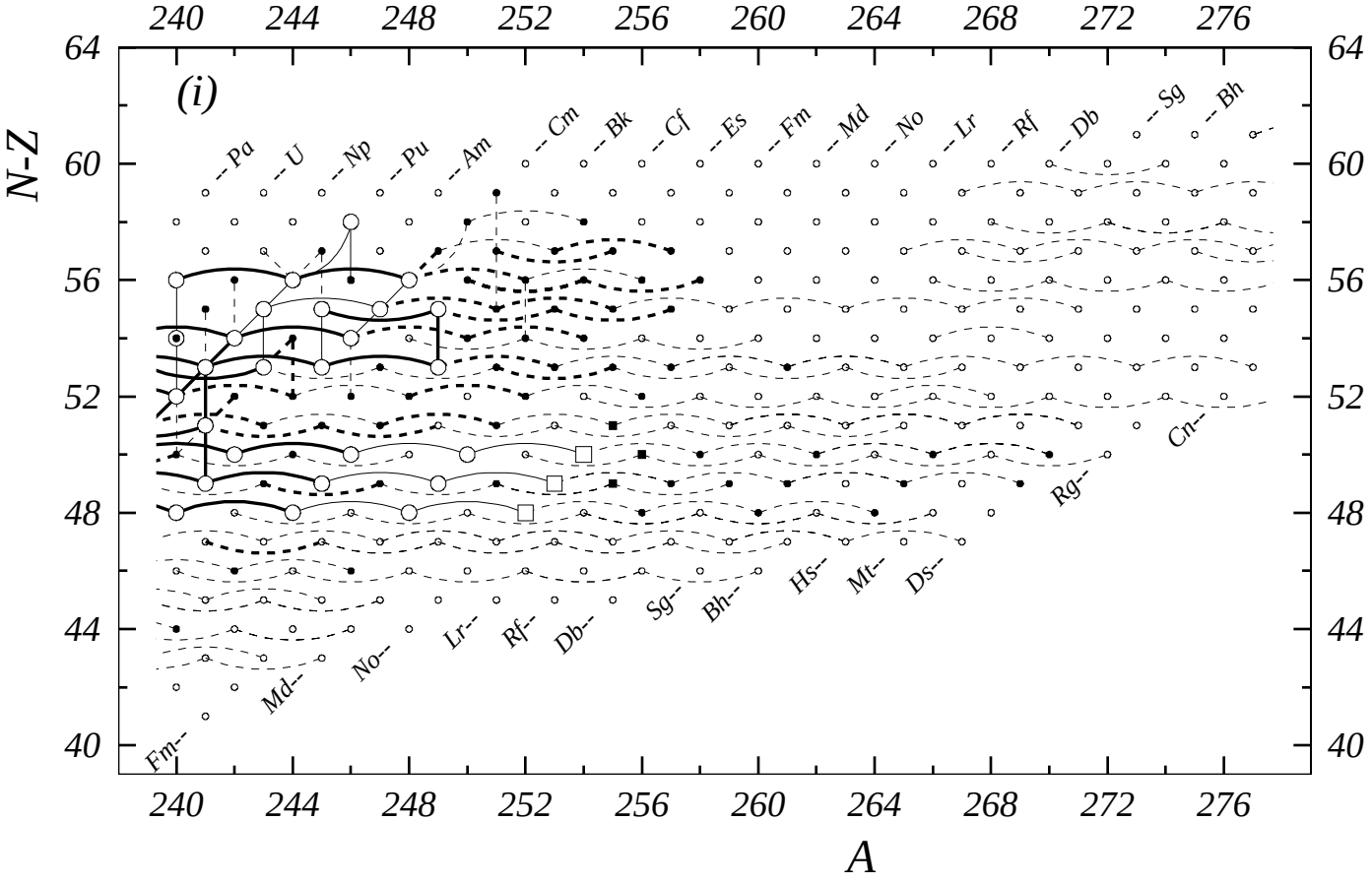
Pa--
U--
Np--
Pu--
Am--
Cm--
Bk--
Cf--
Es--
Fm--
Md--


(i)
N-Z
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56
52
48
44
40
Pa
U
Np
Pu
Am
Cm
Bk
Cf
Es
Fm
Md
No
Lr
Rf
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Cn
Rg
Ds
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Sg
Db
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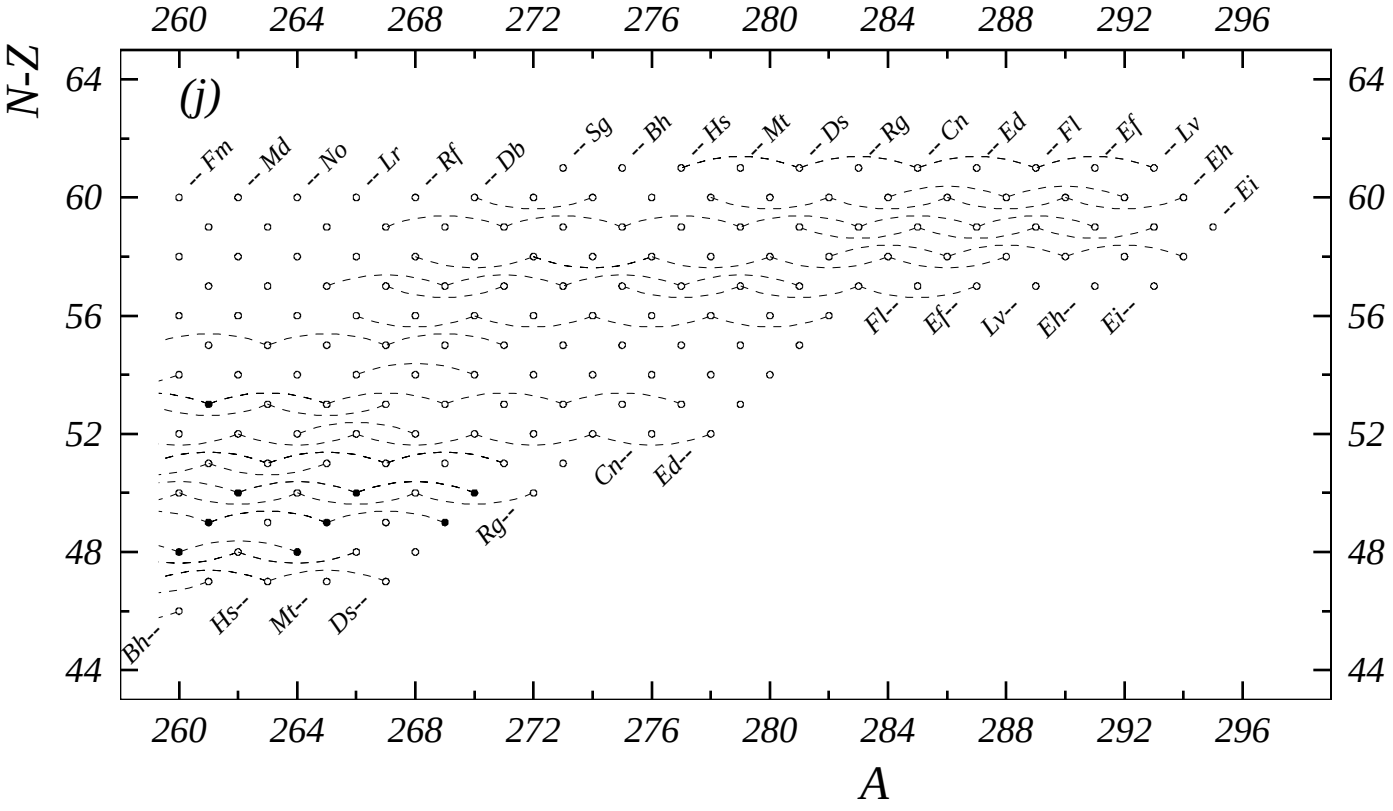
(j)
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Fm
Md
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Rf
Db
Sg
Bh
Hs
Mt
Ds
Rg
Cn
Ed
Fl
Ef
Lv
Eh
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Bh
Hs
Mt
Ds
Rg
Cn
Ed
Fl
Ef
Lv
Eh
Ei