

The Atomic Mac

Atomic PC

Version 7.0.0 May 2, 2018

Note: This documentation refers to the program as Atomic Mac, but is also valid for the Atomic PC, except as noted.

Introduction

The Atomic Mac is a Periodic Table of the Elements. It runs under macOS and Windows. The price to buy your copy is only \$24.99. Until you buy, you will only be able to look at data for a few selected elements.

Atomic Mac 6.0.0b2

Normal View

Alkali metals
Alkaline earth metals
Transition metals
Other metals
Nonmetals
Noble gases
Lanthanide series
Actinide series

1.01 1 H																	4.00 2 He				
6.94 3 Li	9.01 4 Be															10.81 5 B	12.01 6 C	14.01 7 N	16.00 8 O	19.00 9 F	20.18 10 Ne
22.99 11 Na	24.31 12 Mg															26.98 13 Al	28.09 14 Si	30.97 15 P	32.06 16 S	35.45 17 Cl	39.95 18 Ar
39.10 19 K	40.08 20 Ca	44.96 21 Sc	47.87 22 Ti	50.94 23 V	52.00 24 Cr	54.94 25 Mn	55.85 26 Fe	58.93 27 Co	58.69 28 Ni	63.55 29 Cu	65.39 30 Zn	69.72 31 Ga	72.64 32 Ge	74.92 33 As	78.96 34 Se	79.90 35 Br	83.80 36 Kr				
85.47 37 Rb	87.62 38 Sr	88.91 39 Y	91.22 40 Zr	92.91 41 Nb	95.94 42 Mo	98.00 43 Tc	101.07 44 Ru	102.91 45 Rh	106.42 46 Pd	107.87 47 Ag	112.41 48 Cd	114.82 49 In	118.71 50 Sn	121.76 51 Sb	127.60 52 Te	126.90 53 I	131.29 54 Xe				
132.91 55 Cs	137.33 56 Ba			178.49 72 Hf	180.95 73 Ta	183.84 74 W	186.21 75 Re	190.23 76 Os	192.22 77 Ir	195.08 78 Pt	196.97 79 Au	200.59 80 Hg	204.38 81 Tl	207.20 82 Pb	208.98 83 Bi	209.00 84 Po	210.00 85 At	222.00 86 Rn			
223.00 87 Fr	226.00 88 Ra			261.00 104 Rf	262.00 105 Db	265.00 106 Sg	264.00 107 Bh	269.00 108 Hs	268.00 109 Mt	271.00 110 Ds	272.00 111 Uuu	277.00 112 Uub	281.00 113 Uut	285.00 114 Uuq	287.00 115 Uup	289.00 116 Uuh	291.00 117 Uus	293.00 118 Uuo			

Lanthanoids

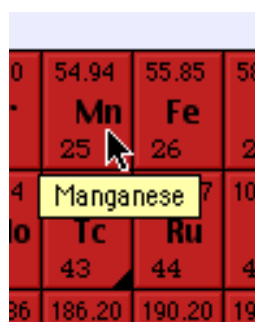
138.91 57 La	140.12 58 Ce	140.91 59 Pr	144.24 60 Nd	145.00 61 Pm	150.36 62 Sm	151.96 63 Eu	157.25 64 Gd	158.93 65 Tb	162.50 66 Dy	164.93 67 Ho	167.26 68 Er	168.93 69 Tm	173.04 70 Yb	174.97 71 Lu
227.00 89 Ac	232.04 90 Th	231.04 91 Pa	238.03 92 U	237.00 93 Np	244.00 94 Pu	243.00 95 Am	247.00 96 Cm	247.00 97 Bk	251.00 98 Cf	254.00 99 Es	257.00 100 Fm	258.00 101 Md	255.00 102 No	256.00 103 Lr

Actinoids

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Chris Smolinski
For use only on a single machine

When you first launch the Atomic Mac, you see a normal presentation of the periodic table of the elements.

If you place the cursor over an element for a few seconds, you'll see the name of the element pop up.



The image shows a small section of the periodic table with a red background. A mouse cursor is hovering over the element Manganese (Mn). A yellow tooltip box appears over the element, displaying the name 'Manganese'. The table cells show atomic numbers, element symbols, and atomic weights.

0	54.94	55.85	58
	Mn	Fe	
	25	26	2
4	Manganese	7	10
10	Tc	Ru	
	43	44	4
36	186.20	190.20	19

Clicking on one of the elements brings up a window that contains detailed information about that element. You can copy many of the data values to the clipboard by clicking on the value with the mouse, you'll hear a short faint click sound when you click on a value you can copy. You can then paste the value into another application.


You can also open the text list of elements (from the Windows menu) to get an alphabetical list of elements. Double click on one to open the detailed view window for that element.

There are six different sets of detailed information you can display, selected from the tabs in the window. They are:


Physical View - a list of physical properties, such as density, melting point, etc.

Lead

Main Isotopes Shells Xray Misc Spectrum

 **Pb** 207.2(1) 82

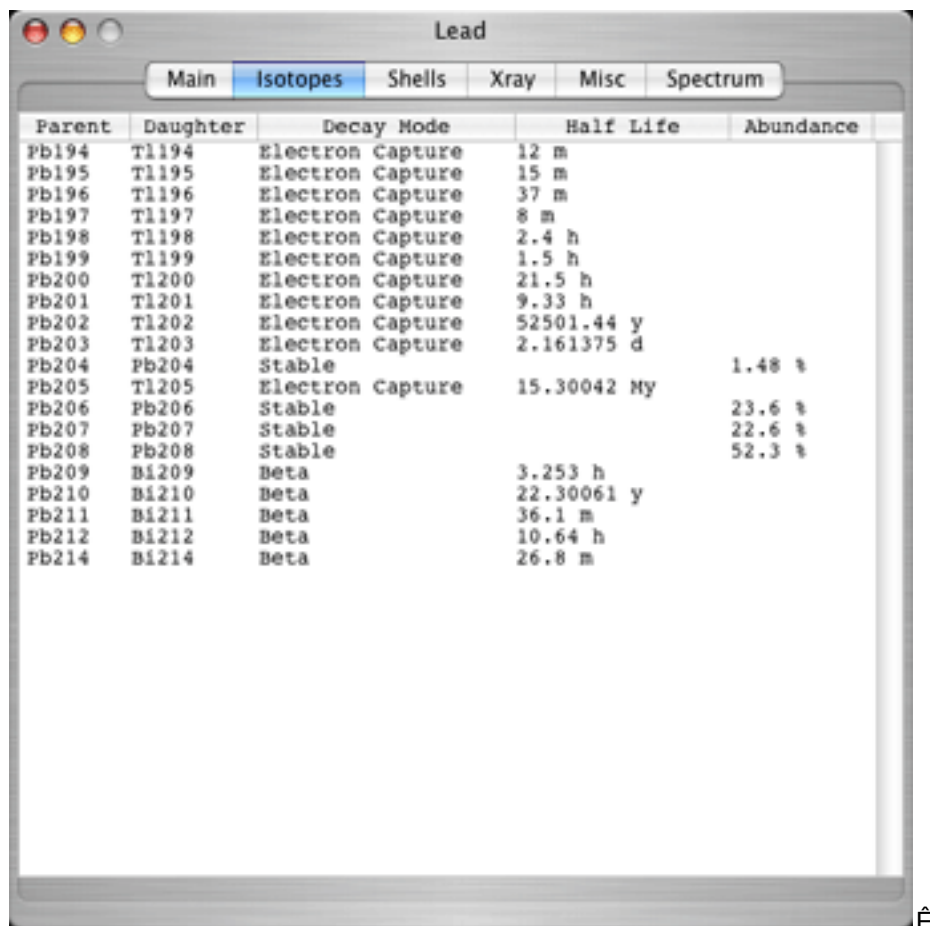
Group: 14
Period: 6
Block: p-block

 Cubic face centered

Crystal Structure: Cubic face centered
Density: 11.35 g/cc
Heat of Vaporization: 862 J/kg
Heat of Fusion: 23.2 J/kg
Specific Heat: 159 J/kg K
Thermal Conductivity: 35.3 W/m/K
Linear Expansion Coefficient: 0.000029/ K
Melting Point: 327.5 °C 600.65 °K 621.5 °F
Boiling Point: 1740 °C 2013.15 °K 3164 °F
Atomic Radius: 1.75 Å
Covalent Radius: 1.47 Å
Susceptibility: -23 microGauss
Resistivity: 208 nanoOhm meter
Electron Affinity: 0.364 eV
Electric Dipole Polarizability: 6.8 10⁻²⁴ cc
Photoelectric Work: 4 eV
Pauling Electronegativity: 2.02
Oxidation State(s): 2 4
Ionization Potentials: 7.416 V 15.032 V 31.937 V
Superconductivity: 7.2 K
CAS Registry ID: 7439-92-1

All

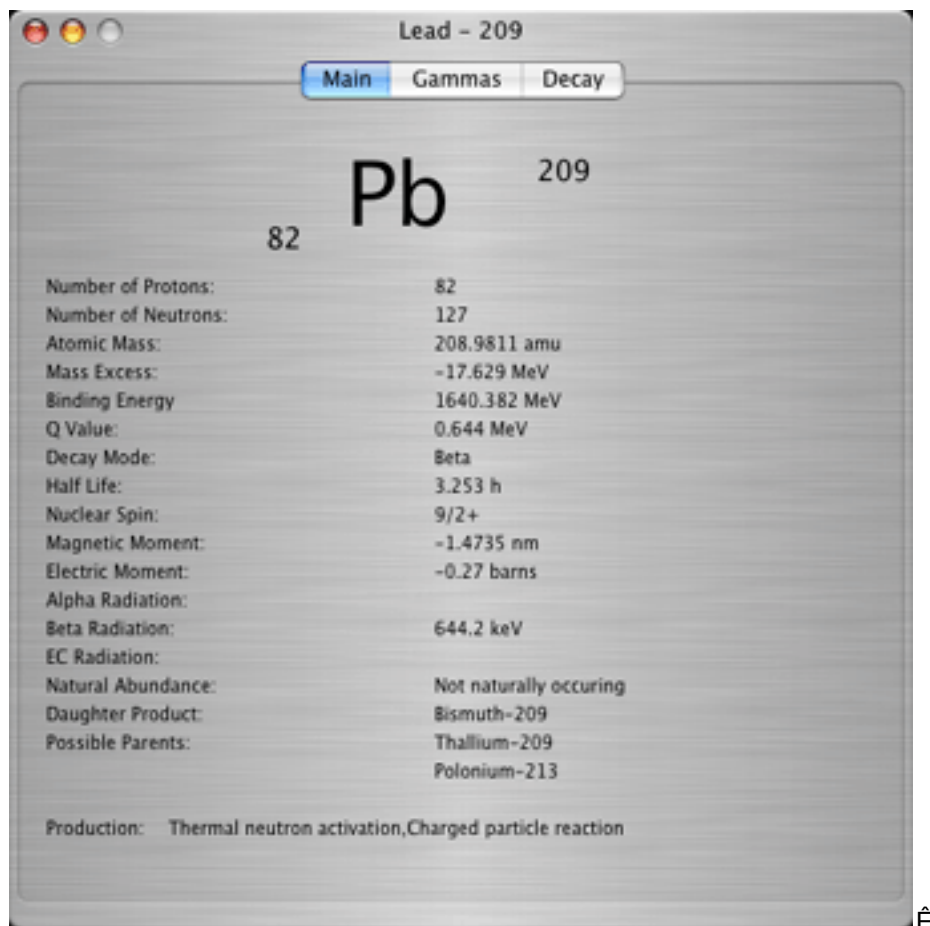
Isotopes View - a list of all isotopes for this element, showing the atomic mass, decay mode, half life, and percent natural abundance. If there are too many isotopes to fit in the window, then you can scroll down the list.



Parent	Daughter	Decay Mode	Half Life	Abundance
Pb194	Tl194	Electron Capture	12 m	
Pb195	Tl195	Electron Capture	15 m	
Pb196	Tl196	Electron Capture	37 m	
Pb197	Tl197	Electron Capture	8 m	
Pb198	Tl198	Electron Capture	2.4 h	
Pb199	Tl199	Electron Capture	1.5 h	
Pb200	Tl200	Electron Capture	21.5 h	
Pb201	Tl201	Electron Capture	9.33 h	
Pb202	Tl202	Electron Capture	52501.44 y	
Pb203	Tl203	Electron Capture	2.161375 d	
Pb204	Pb204	Stable		1.48 %
Pb205	Tl205	Electron Capture	15.30042 My	
Pb206	Pb206	Stable		23.6 %
Pb207	Pb207	Stable		22.6 %
Pb208	Pb208	Stable		52.3 %
Pb209	Bi209	Beta	3.253 h	
Pb210	Bi210	Beta	22.30061 y	
Pb211	Bi211	Beta	36.1 m	
Pb212	Bi212	Beta	10.64 h	
Pb214	Bi214	Beta	26.8 m	

Isotope Detail View

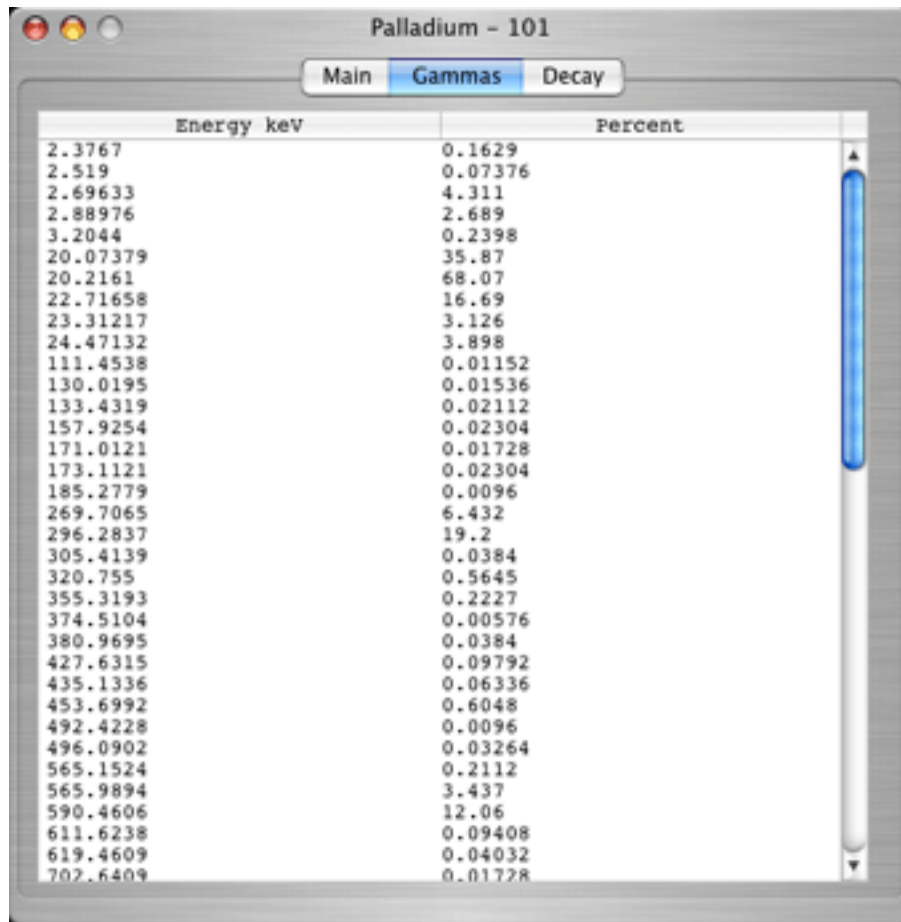
Clicking on an isotope will bring up the another window, with detailed information, such as the number of protons and neutrons, atomic mass, mass excess, binding energy, natural abundance, decay mode and half life, nuclear spin, magnetic moment, and alpha and beta radiation energies. (Not all information is available for all isotopes) In addition, possible parent nuclides are also listed, as well as the daughter product.



Lead - 209	
Main Gammas Decay	
82	Pb 209
Number of Protons:	82
Number of Neutrons:	127
Atomic Mass:	208.9811 amu
Mass Excess:	-17.629 MeV
Binding Energy	1640.382 MeV
Q Value:	0.644 MeV
Decay Mode:	Beta
Half Life:	3.253 h
Nuclear Spin:	9/2+
Magnetic Moment:	-1.4735 nm
Electric Moment:	-0.27 barns
Alpha Radiation:	
Beta Radiation:	644.2 keV
EC Radiation:	
Natural Abundance:	Not naturally occuring
Daughter Product:	Bismuth-209
Possible Parents:	Thallium-209 Polonium-213
Production:	Thermal neutron activation, Charged particle reaction

Gamma Rays

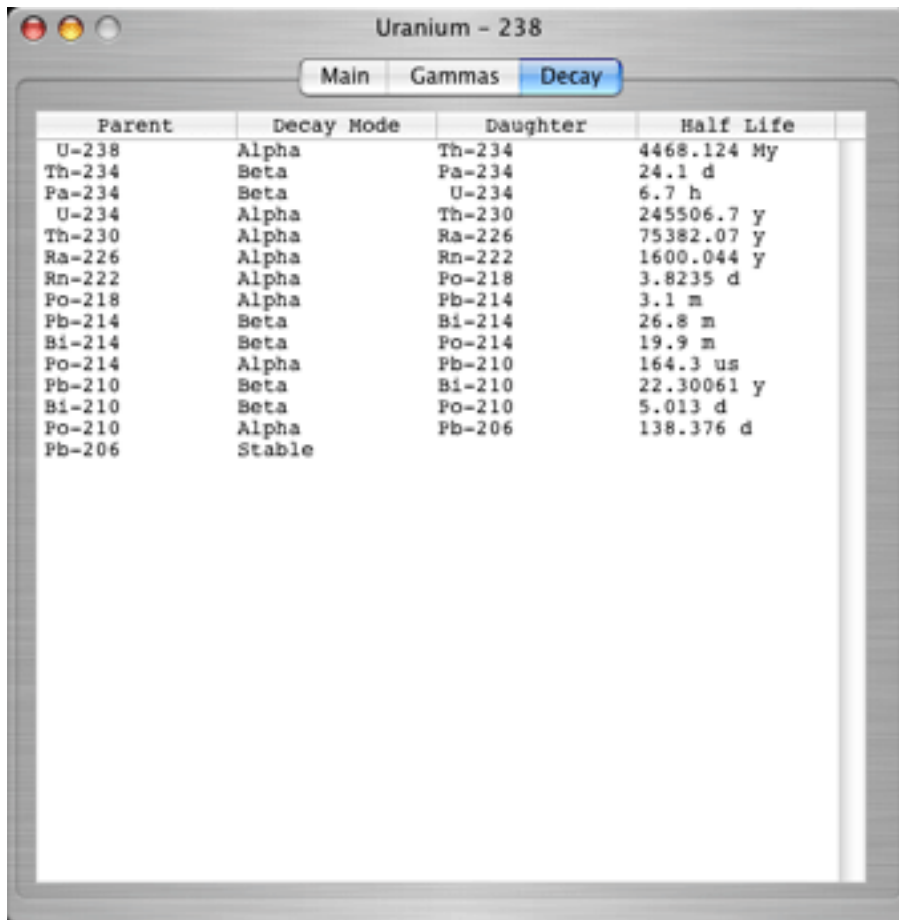
Clicking on the Gammas tab will bring up a window listing all of the gamma rays that occur in at least 0.1% of transitions.



Energy keV	Percent
2.3767	0.1629
2.519	0.07376
2.69633	4.311
2.88976	2.689
3.2044	0.2398
20.07379	35.87
20.2161	68.07
22.71658	16.69
23.31217	3.126
24.47132	3.898
111.4538	0.01152
130.0195	0.01536
133.4319	0.02112
157.9254	0.02304
171.0121	0.01728
173.1121	0.02304
185.2779	0.0096
269.7065	6.432
296.2837	19.2
305.4139	0.0384
320.755	0.5645
355.3193	0.2227
374.5104	0.00576
380.9695	0.0384
427.6315	0.09792
435.1336	0.06336
453.6992	0.6048
492.4228	0.0096
496.0902	0.03264
565.1524	0.2112
565.9894	3.437
590.4606	12.06
611.6238	0.09408
619.4609	0.04032
702.6409	0.01728

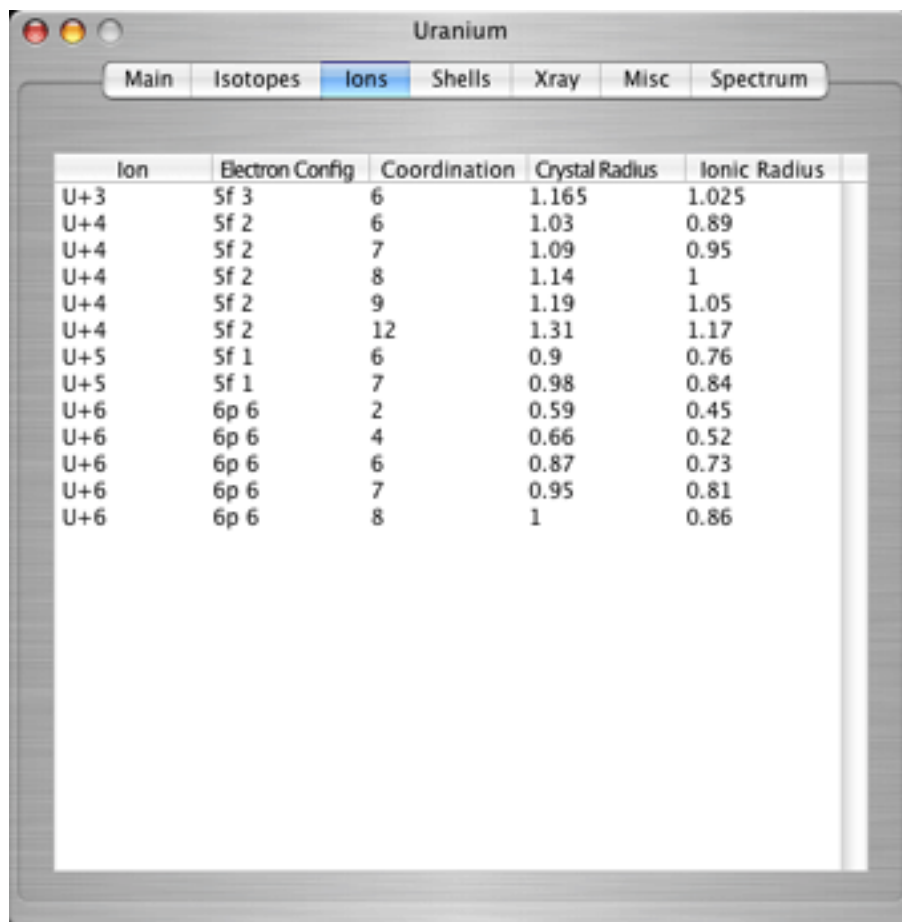
Decay Tree

Clicking on the Decay tab will display the path taken by the nuclide as it and daughter products decay, until they become stable. This view is of course only useful for radioactive nuclides.



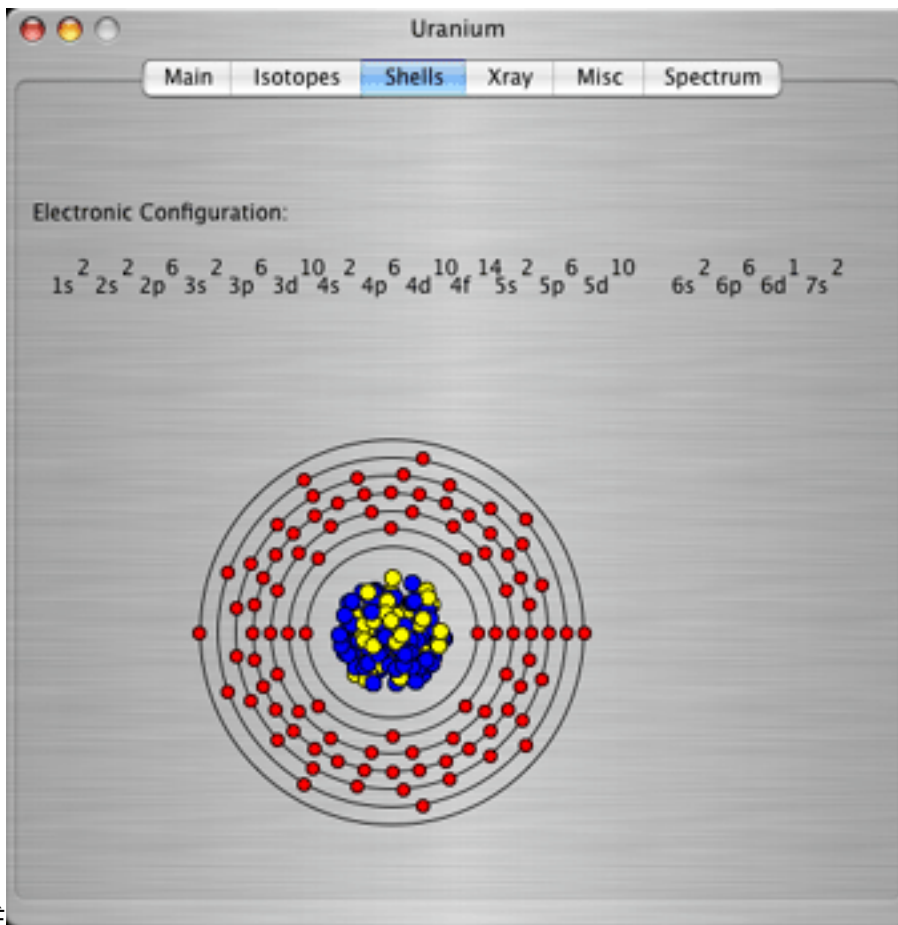
Parent	Decay Mode	Daughter	Half Life
U-238	Alpha	Th-234	4468.124 My
Th-234	Beta	Pa-234	24.1 d
Pa-234	Beta	U-234	6.7 h
U-234	Alpha	Th-230	245506.7 y
Th-230	Alpha	Ra-226	75382.07 y
Ra-226	Alpha	Rn-222	1600.044 y
Rn-222	Alpha	Po-218	3.8235 d
Po-218	Alpha	Pb-214	3.1 m
Pb-214	Beta	Bi-214	26.8 m
Bi-214	Beta	Po-214	19.9 m
Po-214	Alpha	Pb-210	164.3 us
Pb-210	Beta	Bi-210	22.30061 y
Bi-210	Beta	Po-210	5.013 d
Po-210	Alpha	Pb-206	138.376 d
Pb-206	Stable		

Ions View - a listing of the crystal and ionic radii for various ions and coordination numbers. Radii data are in Angstroms.

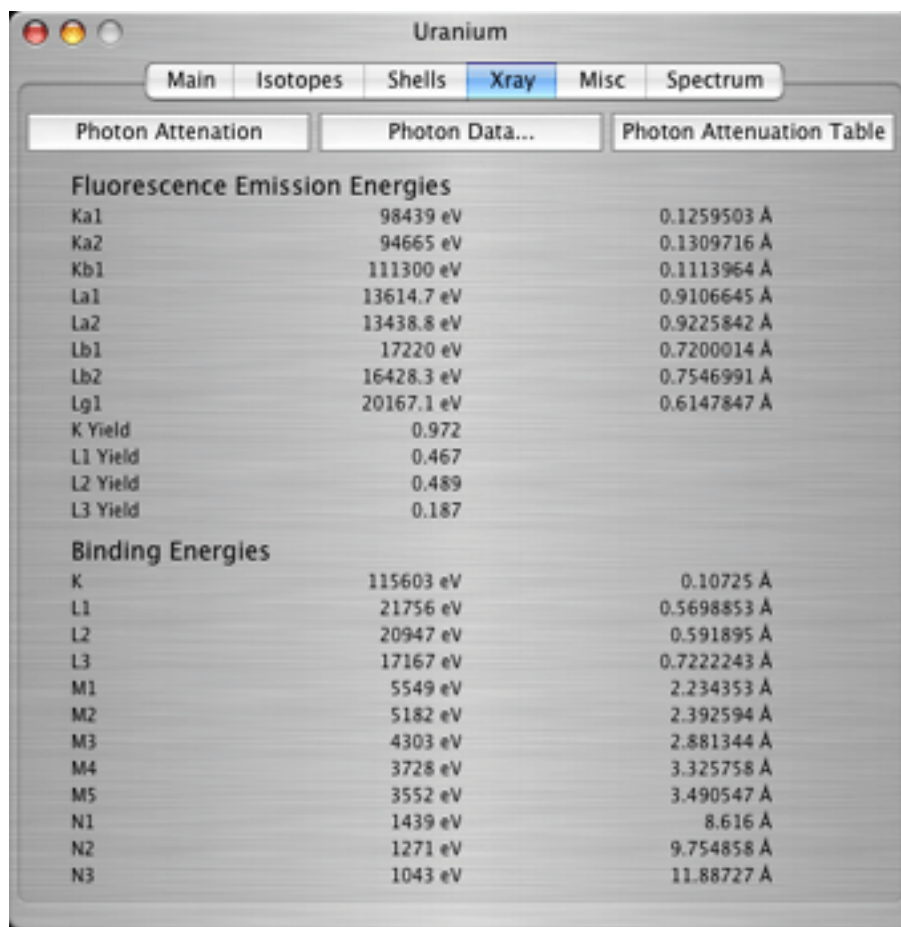


Ion	Electron Config	Coordination	Crystal Radius	Ionic Radius
U+3	Sf 3	6	1.165	1.025
U+4	Sf 2	6	1.03	0.89
U+4	Sf 2	7	1.09	0.95
U+4	Sf 2	8	1.14	1
U+4	Sf 2	9	1.19	1.05
U+4	Sf 2	12	1.31	1.17
U+5	Sf 1	6	0.9	0.76
U+5	Sf 1	7	0.98	0.84
U+6	6p 6	2	0.59	0.45
U+6	6p 6	4	0.66	0.52
U+6	6p 6	6	0.87	0.73
U+6	6p 6	7	0.95	0.81
U+6	6p 6	8	1	0.86

Shells View - a graphical display of the atom, showing the electron shells, along with the electronic configuration.



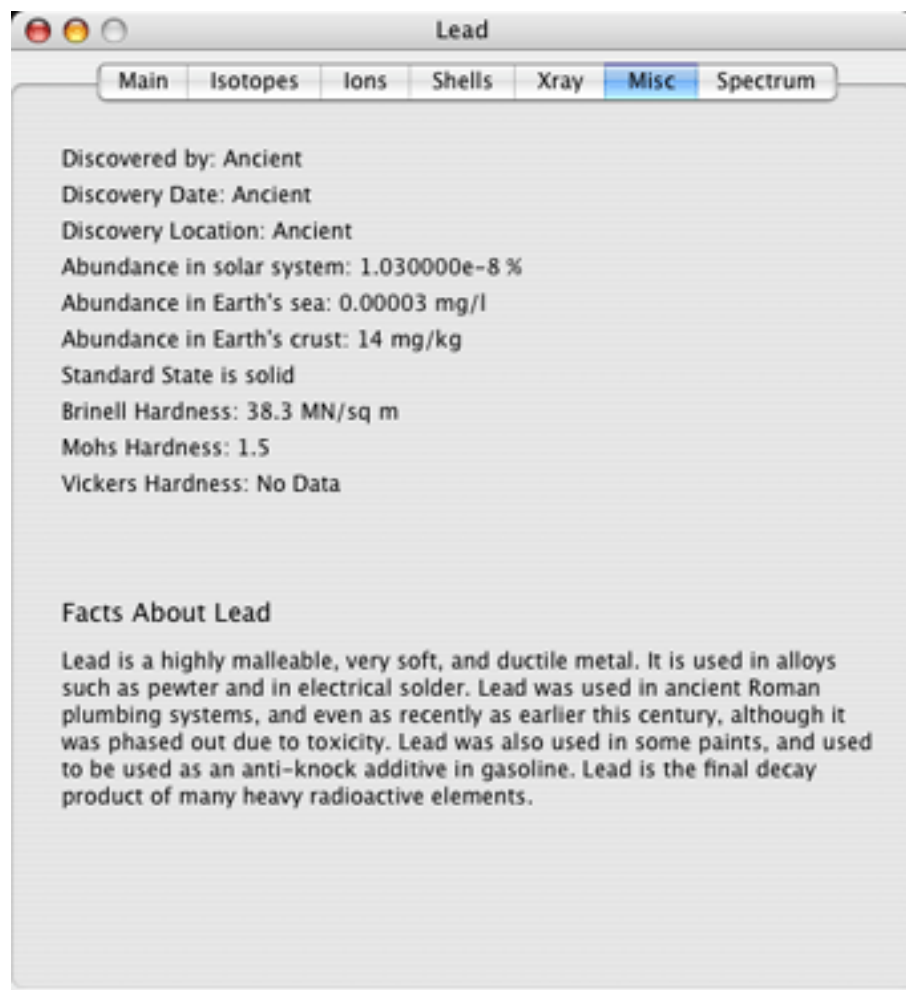
X-Ray View - A list of the K and L shell fluorescence energies, and K, L, M, and N shell binding energies. Clicking on the Photon Attenuation button will bring up a window showing the attenuation graph, while clicking on the Photon Attenuation Table button will bring up a tabular form of the same data. The information is based on the McMaster data. Clicking on the Photon Data button will bring up an interactive window, allow you to display the relevant data for any energy between 1 keV and 10 MeV.



Fluorescence Emission Energies		
Ka1	98439 eV	0.1259503 Å
Ka2	94665 eV	0.1309716 Å
Kb1	111300 eV	0.1113964 Å
La1	13614.7 eV	0.9106645 Å
La2	13438.8 eV	0.9225842 Å
Lb1	17220 eV	0.7200014 Å
Lb2	16428.3 eV	0.7546991 Å
Lg1	20167.1 eV	0.6147847 Å
K Yield	0.972	
L1 Yield	0.467	
L2 Yield	0.489	
L3 Yield	0.187	
Binding Energies		
K	115603 eV	0.10725 Å
L1	21756 eV	0.5698853 Å
L2	20947 eV	0.591895 Å
L3	17167 eV	0.7222243 Å
M1	5549 eV	2.234353 Å
M2	5182 eV	2.392594 Å
M3	4303 eV	2.881344 Å
M4	3728 eV	3.325758 Å
M5	3552 eV	3.490547 Å
N1	1439 eV	8.616 Å
N2	1271 eV	9.754858 Å
N3	1043 eV	11.88727 Å

Misc View - General information showing the name of the discoverer of the element, and where and when it was discovered. Interesting bits of information are also displayed, including the Brinell, Mohs, and Vickers hardness, as well as the standard (room temperature) state of the element.

If you have any other interesting facts about an element, let us know, and we'll be glad to add them to a future version.



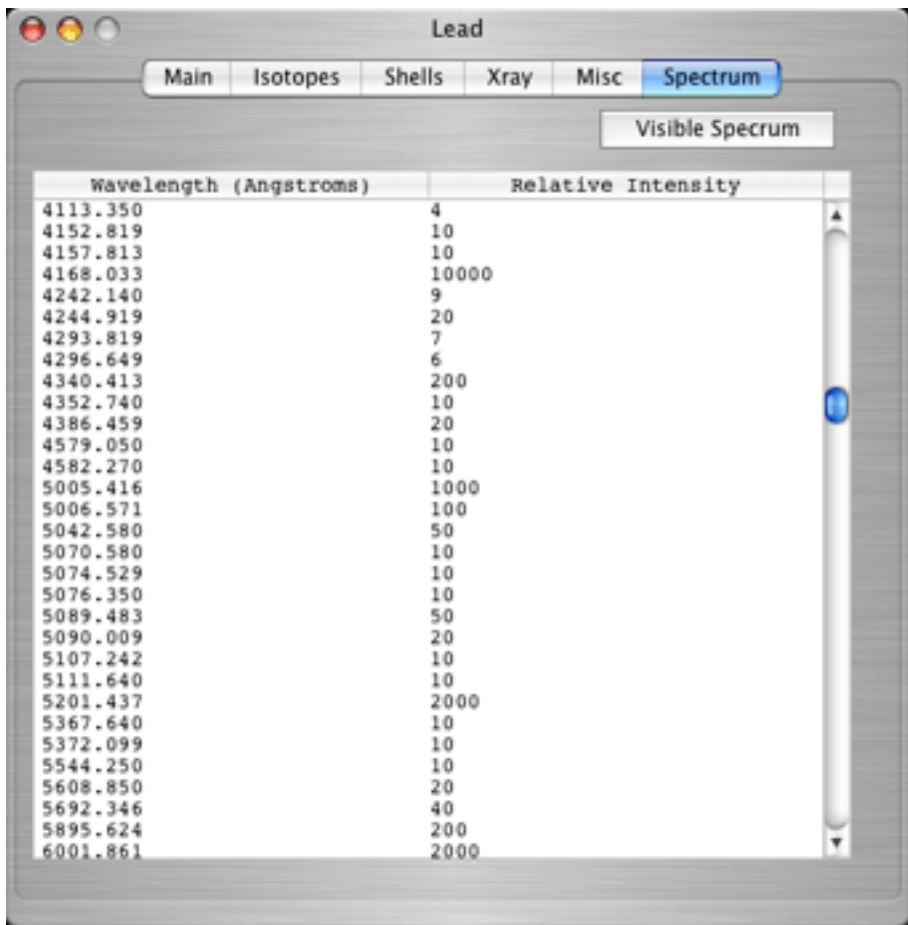
The screenshot shows a window titled "Lead" with a tabbed interface. The tabs are "Main", "Isotopes", "Ions", "Shells", "Xray", "Misc" (selected), and "Spectrum". The "Misc" tab displays the following information:

- Discovered by: Ancient
- Discovery Date: Ancient
- Discovery Location: Ancient
- Abundance in solar system: $1.030000e-8$ %
- Abundance in Earth's sea: 0.00003 mg/l
- Abundance in Earth's crust: 14 mg/kg
- Standard State is solid
- Brinell Hardness: 38.3 MN/sq m
- Mohs Hardness: 1.5
- Vickers Hardness: No Data

Below this information is a section titled "Facts About Lead" with the following text:

Lead is a highly malleable, very soft, and ductile metal. It is used in alloys such as pewter and in electrical solder. Lead was used in ancient Roman plumbing systems, and even as recently as earlier this century, although it was phased out due to toxicity. Lead was also used in some paints, and used to be used as an anti-knock additive in gasoline. Lead is the final decay product of many heavy radioactive elements.

Spectrum View - A list of the wavelengths and relative intensities of the optical spectra of an element, including visible, UV, and IR.



Lead

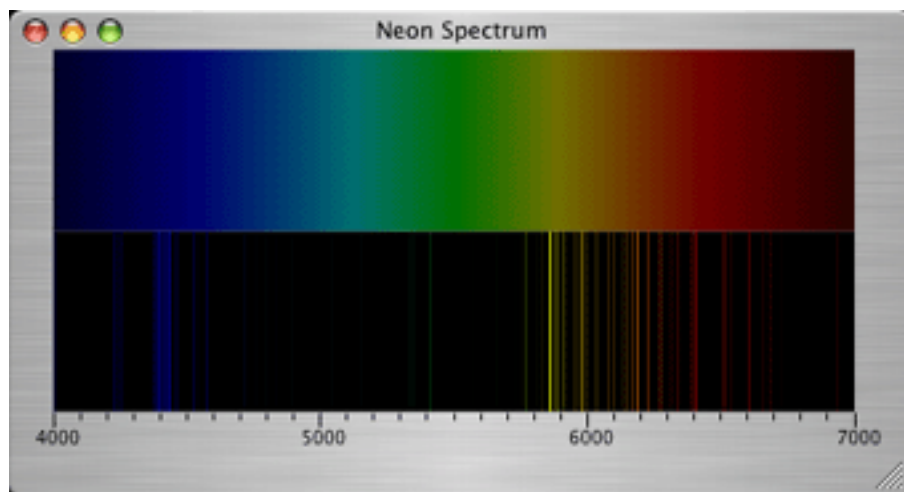
Main Isotopes Shells Xray Misc **Spectrum**

Visible Spectrum

Wavelength (Angstroms)	Relative Intensity
4113.350	4
4152.819	10
4157.813	10
4168.033	10000
4242.140	9
4244.919	20
4293.819	7
4296.649	6
4340.413	200
4352.740	10
4386.459	20
4579.050	10
4582.270	10
5005.416	1000
5006.571	100
5042.580	50
5070.580	10
5074.529	10
5076.350	10
5089.483	50
5090.009	20
5107.242	10
5111.640	10
5201.437	2000
5367.640	10
5372.099	10
5544.250	10
5608.850	20
5692.346	40
5895.624	200
6001.861	2000

Visible Spectrum Display

Clicking on the Visible Spectrum button will bring up a window showing the visible line spectrum of the element, along with a complete (rainbow) spectrum for reference.



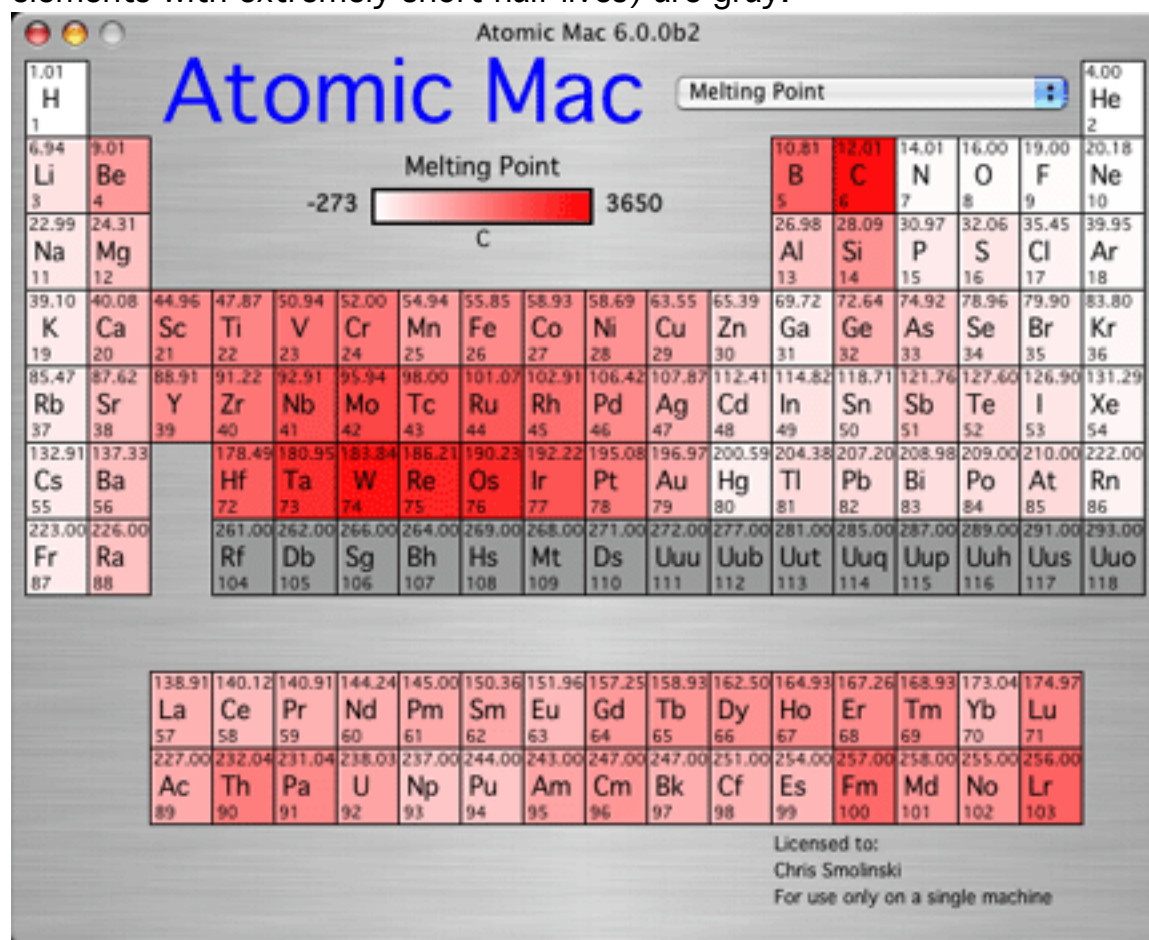
Property View

You can also alter the periodic table display to shade each element, by several properties, which include:

- Density
- Heat of Vaporization
- Heat of Fusion
- Specific Heat
- Thermal Conductivity
- Linear Expansion Coefficient
- Melting Point
- Boiling Point
- Atomic Radius
- Covalent Radius
- Magnetic Susceptibility
- Electrical Resistivity
- Electron Affinity
- Electric Dipole Polarizability
- State (gas, liquid, solid)
- Photoelectric Work Function
- Electronegativity
- Crystal Structure

Abundance in Crust
 Abundance in Sea
 Abundance in Atmosphere
 Solar Abundance
 Number of Isotopes
 Number of Natural Isotopes
 Number of Stable Isotopes
 Atomic Mass
 Superconducting Critical Tempereature
 First Ionization Potential
 Second Ionization Potential
 Third Ionization Potential

Below is a display with the view set to melting point. The elements with higher melting points are more red, those with lower melting points are more white. Elements for which there is no data (typically the man-made transuranic elements with extremely short half lives) are gray.



These properties are selected under the View menu. If you place the cursor over an element for a few seconds, you'll see the name of the element pop up, as

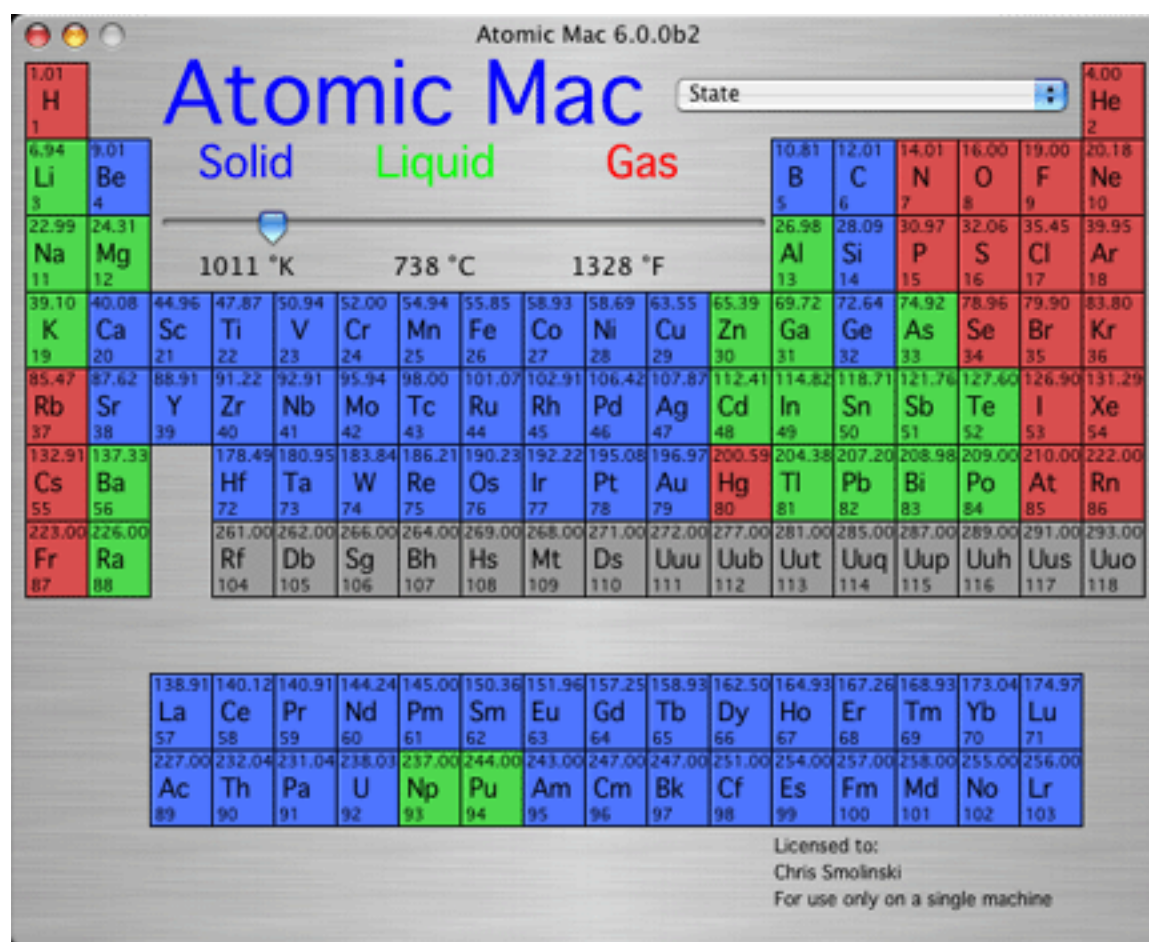
well as the value for that view.

Temperature State View

When viewing the state, you can change the temperature using the slider control. The selected temperature is displayed below, in degrees Kelvin, Centigrade, and Fahrenheit.

You can also use the + and - keys on the numeric keypad to increase and decrease the temperature by one degree. Holding down option will make the change 10 degrees, and holding down shift will make the change 100 degrees.

The following picture shows the state of each element at 1000 degrees Kelvin:



One of the views is the Molecular Weight Calculator. Selecting this will display a text entry box just above the periodic table. You can enter a chemical formula into this box, and the molecular weight will be calculated for you. For example, entering H₂O will compute the molecular weight of water. The text is case

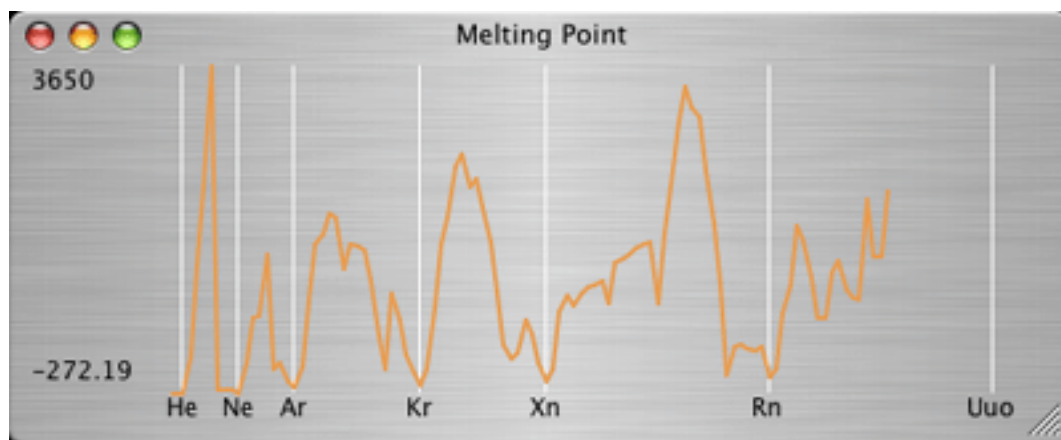
sensitive, so table salt must be entered as NaCl not NACL or nacl.

You can enter parenthesis in your formula, such as (H₂O)₂

You can also enter in a hydrated compound using the • symbol (option 8 on your keyboard). An example: CuSO₄• 5H₂O

Graphing Properties

Under the File menu is an option to graph the current view. Selecting this opens a window which shows a plot of the selected property against atomic number. The following picture shows a plot of the covalent radius:



Values of adjacent elements with known values are connected with a line. If an element is surrounded by two other elements with unknown values, its value appears as an isolated dot.

X-Ray Energies Graph Window

By selecting X-Ray Energies from the File menu, you can get a graph showing the various fluorescence and edge energies for the elements. The range of the horizontal (energy) axis can be changed, allowing you to zoom in on particular energy ranges. Positioning the cursor over a line shows the element, and the

edge or fluorescence energy and type. Popup menus allow only specific transitions or edges to be displayed, removing unnecessary clutter.

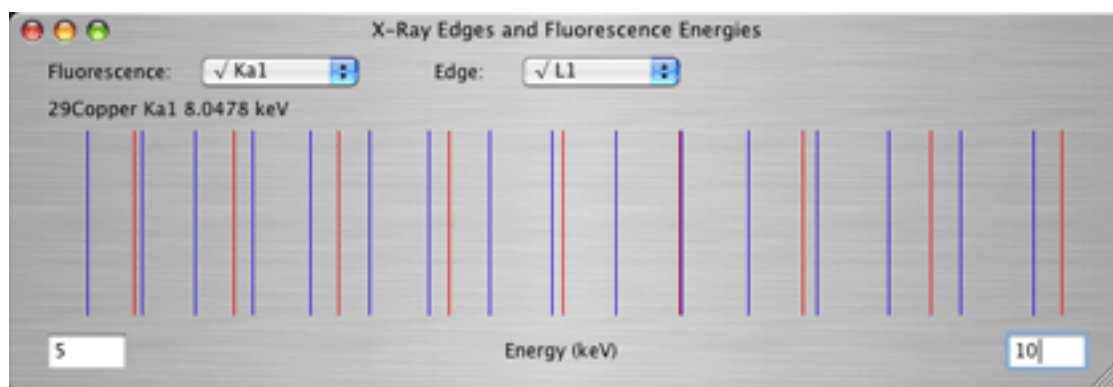


Table Of Nuclides

By selecting Nuclides Table from the File menu, you'll be presented with a large window showing all of the nuclides (isotopes) available. Clicking on one of them will bring up the window containing detailed information, such as nuclear spin, decay energies, etc. Here's a small portion of the table, the full table of course is huge, since The Atomic Mac has information regarding about 1600 nuclides!

Color Code for Nuclides Table:

Stable	- Gray
Beta Decay	- Green
Alpha Decay	- Blue
Positron Decay	- Red
Electron Capture	- Orange
Double Alpha Decay	- Purple
Isometric	- Tan
Spontaneous Fission	- Yellow
Neutron Emission	- Aqua
Proton Emission	- Brown

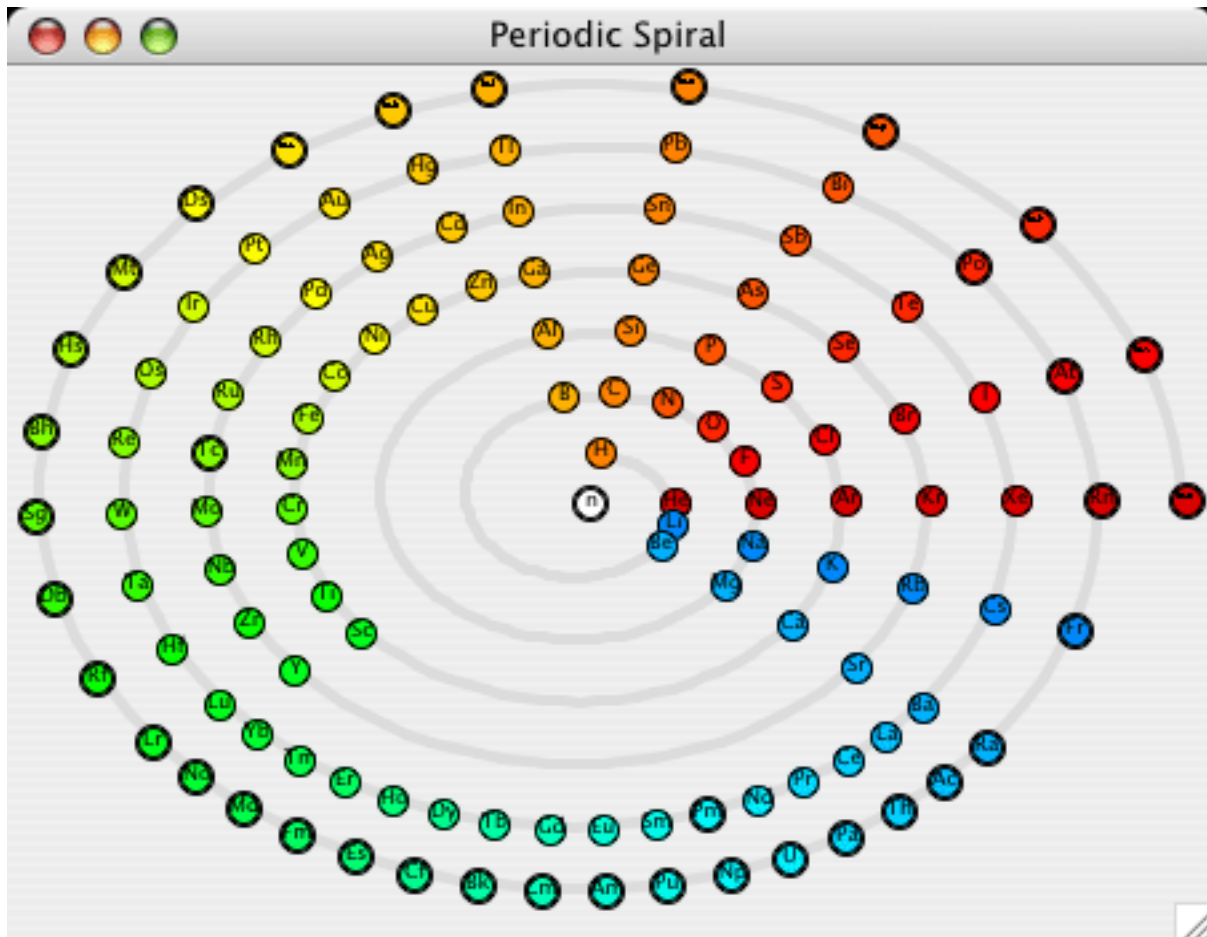
A popup menu in the upper left corner of the window allows you to change the display from decay mode to one of several other types of information:

Electric Moment

[illegible]

Periodic Spiral

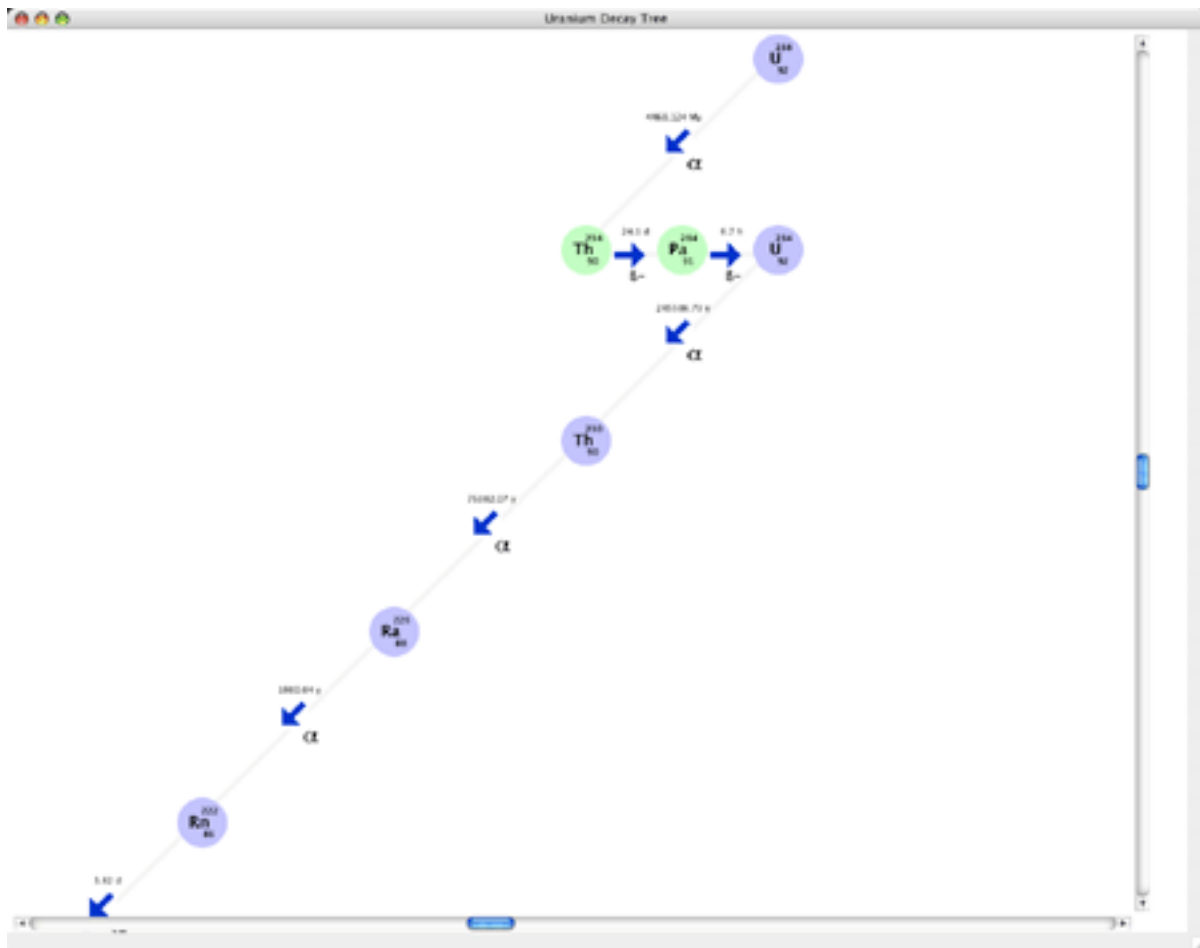
By selecting Periodic Spiral from the File menu, you'll be presented with a large window showing an alternate presentation for the periodic table of elements.



In this presentation, the neutron is in the center, and the elements spiral outwards. Each radial line from the center is similar to a group or column in the standard table. One advantage over the traditional table is that there are no "edges" on each line or period, the elements continuously flow one after the other, much as they do in nature.

Decay Tree Window

By clicking the Decay Tree button in an isotope window, you will display a window that shows the decay path until a stable nuclide is reached. This is only useful for radioactive nuclides, of course.



Getting the latest copy of The Atomic Mac

You can always get the latest copy of The Atomic Mac from our web site, the URL is:

<http://www.blackcatsystems.com/software/atomic.html>

You can launch your web browser and automatically go to this page by selecting Go To The Atomic Mac Website from under the Apple Menu.

If you have suggestions for improving The Atomic Mac, please let us know!

You can send us email at info@blackcatsystems.com

Please take a look at the next chapter to learn how to buy your copy of The Atomic Mac.

Purchasing the Atomic Mac

The Atomic Mac is distributed as shareware. The price is only 24.99, allowing the use on a single computer. If you wish to run The Atomic Mac on multiple computers, you must obtain a license for each system, or the appropriate site license.

Site licenses are also available, allowing copies to be run on multiple computers at a single location (for example, a school or university, or office). Please contact Black Cat Systems for pricing and details about site licensing.

By buying your copy of The Atomic Mac, you'll help support our efforts to develop new versions with additional information. When you register, you'll be entitled to use all new releases and updates to The Atomic Mac released over the next year, free of charge.

When you buy and receive your registration code, select Enter Registration... from the Edit menu, and enter the code. If you register and don't get your registration code within a week, please send us an email at info@blackcatsystems.com.

Thanks again for giving The Atomic Mac a try.

Black Cat Systems
4708 Trail Court
Westminster, MD 21158

email: info@blackcatsystems.com
Web: <http://www.blackcatsystems.com/software/atomic.html>

Buying by Check or Money Order Form

To order by check, please fill out and mail the following form, along with your payment. You can pay with a wide variety of cash from different countries but at present if you pay via check, it must be a check or money order drawn in US Dollars. While there is the risk of loss in the mail, currency is also OK, including foreign currency.

Please make sure you include your email address with your payment. That way we can send the registration code to you. If you do not send us a valid email address, we have no way to send you the code.

----- The Atomic Mac/PC CHECK / MONEY-ORDER ORDER FORM -----

I would like to register _____ copies of The Atomic Mac @ \$24.99 each

I would like to register _____ Atomic Mac/iUnit Combos @ \$34.99 each

I would like to register _____ copies of The Atomic PC @ \$24.99 each

I would like to register _____ Atomic PC/iUnit Combos @ \$34.99 each

I would like to register _____ site licenses for The Atomic Mac @ \$250

I would like to register _____ site licenses for The Atomic PC @ \$250

Maryland residents please add 6% sales tax.

TOTAL AMOUNT ENCLOSED: _____ in US funds.

Please send my registration code to:

Name: _____

Address: _____

City: _____ State: _____

Zip or Postal Code: _____ Country: _____

Email address: _____

Including your CORRECT email address is VERY important as this is how we will contact you with your registration code.

Make checks and money orders out to: Black Cat Systems

Mail This Form To:

Black Cat Systems
4708 Trail Court
Westminster, MD 21158
USA

Buying Online

To purchase online with a credit card, go to the following URL:

<http://www.blackcatsystems.com/register/atomic.html>

Please make sure you include your email address when you buy online. That way we can send the registration code to you. If you do not send us a valid email address, we have no way to send you the code.

Revision History

7.0.0:

Updated to 64 bit app for macOS.
Several minor bug fixes.

6.9.5:

Corrected a bug that caused a crash in Windows builds. Mac and Linux updated to keep version numbers in sync.

6.9.4:

Added alternate displays to the Nuclides Table.

6.9.3:

Corrected order of spectrum wavelengths.

6.9.1:

Updated values for Heat of Vaporization and Fusion.

6.9.0:

Added groups for the halogens and metalloids.

6.8.0:

Can click on many data values to copy them to the clipboard, to paste into other programs.

6.7.0:

Can now change the size of the main window.

6.6.0:

Added Universal Binary support for Intel Macs.

6.5.0:

Added Brinell, Mohs, and Vickers hardness data.
Added display of the standard (room temperature) state of the element.
Corrected Abundance in Universe view.
Corrected Fahrenheit temperature in state view.

6.4.0:

Added Bulk, Shear and Young's Modulus, as well as Poisson Ratio data.

Elements with only only radioactive isotopes are indicated as such in the main window.

6.3.1:

Fixed a bug with the Decay Tree Window.

6.3.0:

Added Decay Tree Window.

6.2.0:

Added the Periodic Spiral display.

User interface improvements.

6.1.0:

Can now view and graph first, second, and third ionization potentials.

Added crystal and ionic radii information for ions.

Fixed photon calculation problem if energy = 1 keV.

Fixed a bug with the molecular weight calculator.

6.0.1:

A few minor bug fixes

6.0.0:

Release

6.0.0b2:

Can now print the main window and graphing windows.

6.0.0b1:

First beta release of version 6. Complete re-write of the program.

5.9.6:

Added text list window of all elements.

Added additional isotopes for elements Hydrogen through Neon.

The state temperature can be changed using the keyboard.

5.9.5:

Added graph of fluorescence and edge energies.

Added additional data for x-ray fluorescence and edge energies for the elements 93 to 100.

Added display of version number in main window title.
Added menu option to check for latest version.

5.9.0:
Added additional ionization potential information

5.8.0:
Added photon data button in X-Ray element view to bring up interactive window to compute/display attenuation data.

5.7.0:
Added revised nuclear data

5.6.0:
Added gamma energies

5.5.1:
Fixed a bug with printing under OSX 10.2.

5.5.0:
Updated atomic mass values to latest IUPAC values.

5.4.0:
Can now zoom the main table window down to a small window.

5.3.0:
Added isotope data for abundance in universe and human body.
Added ability to copy most windows to the clipboard for other use.
Enhancements to the decay window.
Some graphs are now log based for better display.
Added/refined data for some nuclides.

5.2.1:
Misc Bug fixes.

5.2.0:
Added display of period, group, block, CAS Registry ID.

5.1.0:
Added window menu, showing list of available windows

5.0.2:

Error in U235 half life

Background of temperature slider not correct color.

5.0.1:

Fixed a bug that prevented the program from running under MacOS 8.1.

5.0.0:

Added pop-up names of elements and view value.

Added atmospheric abundance

Final release!

5.0.0 b2:

Third Carbon Release

Basically the full complement of features

5.0.0 b1:

Second Carbon Release

Added additional features from the 4.x versions.

5.0.0 b0:

Initial Carbon Release

Not all features implemented

4.6.1:

Fixed a bug where the name of the element would sometimes overwrite other information.

4.6.0:

Window locations (and in some cases size as well) are stored

Element name appears in main window when the cursor is over that element.

4.5.0:

Added Nuclides Table.

4.3.0:

Added data for atomic mass, mass excess, binding energy, and alpha and beta decay energies for most nuclides.

4.2.1:

Fixed a bug which could cause the element data window to not appear.

4.2.0:

Added NMR, magnetic moment, electric quadrupole moments.

Added display of additional information to Isotope information.

Added listing of possible parent nuclides.

4.1.0:

Added spectra information.

4.0.0:

Added table and graph of photon interaction data.

Added number of isotopes, stable, natural to graphing.

3.8.0:

Added views for abundance in the Earth's crust and sea, and solar system.

Added display of values in view mode.

Added data for several elements.

3.7.3:

Corrected density for sodium.

Added information for several elements.

3.7.2:

Fixed a bug that displayed a garbled registered user name.

3.7.1:

Compatibility modifications.

3.7.0:

Added graphing display.

3.6.1:

More improvements to the decay window.

3.6.0:

Improvements to the decay window.

3.5.8:

The main table now prints in color.

3.5.7:

Added beta particle energies for some isotopes.

Changed Lawrencium symbol to Lr.

Fixed a bug which could cause a crash on some systems when an element window was closed.

3.5.6:

Added beta particle energies for some isotopes.

Fixed some small bugs.

3.5.5:

Added alpha particle energies for some isotopes.

3.5.1:

Fixed a bug which did not allow selecting the last isotope when following a decay series.

Fixed a bug which could cause a crash if the element information window was closed, and you attempted to increment or decrement to another element.

Added some information for a few of the super-heavy elements.

3.5.0:

Added Covalent Radius, Electronegativity, and Crystal Structure views and data.

Added interesting facts about each element.

Color-coded each series.

Lots of improvements to the display windows.

3.1.2:

Left and right arrow keys change the temperature by 1 degree K when displaying the states of matter.

Fixed a bug which caused an erroneous half life to be displayed for stable isotopes.

3.1.1:

Modified Molecular Calculator to allow use of parenthesis and ¥ symbol.

3.1.0:

Added display of state (gas, liquid, solid), and temperature control.

Added ability to shrink window to small size.

3.0.0:

Added several more categories of data

Added Molecular Weight calculator

Major changes to user interface

2.3.1:

Display and Human-Interface tweaks.

2.3.0:

Lots of GUI work.

Ability to enter registration code directly into the program.

Added several metastable isotopes.

2.2.0:

Added X-Ray information (fluorescence and binding energies).

License files now used to register the program.

2.1.0:

Updated data for several elements.

2.0.0:

Updated to FAT, native on both 68K and PPC systems.

1.4.3:

Isotope display now always reverts to the first page when you change elements.
(The version displayed in the program is 1.4.2, but check the Finder Info, it really is 1.4.3)

1.4.2:

Clicking on an element in the decay tree will jump to that element.

1.4.1:

Re-compiled for 68020 machines, some speed improvement

Changed About... window, it looks a little nicer now, and doesn't beep at you.

1.4.0:

Misc cleanup

1.3.1:

Added several additional isotopes.
Added Decay Tree window.

1.3.0:
Fixed bug which could cause crash upon launch on some systems.

1.2.2:
First Release.

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