

# Explore CHEMISTRY with KALZIUM



**Dr Pratibha Kohli**

**Recipient of:**

**CBSE Teachers Award 2018-19**

**National Award for Innovative Practices and Experiments in  
Education for Schools by DTE, NCERT – 2018-19**

**State Teacher Award -2015**

# Modern Periodic Table



- **Elements are arranged according to their atomic number which is a more fundamental property of the elements.**
- **Systematic grouping of elements into four blocks; s-block, p-block, d-block and f-block**
- **The position of the elements in the Periodic Table makes it easy to predict and compare their properties,**

2019

IYPT



# IYPT 2019



- **The Periodic Table of Chemical Elements** is one of the most significant achievements in science, capturing the essence not only of chemistry, but also of physics, medicine, earth sciences and biology.
- 1869 is considered as the year of discovery of the Periodic System, and Mendeleev had a major contribution. 2019 was the 150th anniversary of the Periodic Table of Chemical Elements and has therefore been proclaimed the **“International Year of the Periodic Table of Chemical Elements (IYPT2019)”** by the United Nations General Assembly and UNESCO.



2019

IYPT



# KALZIUM



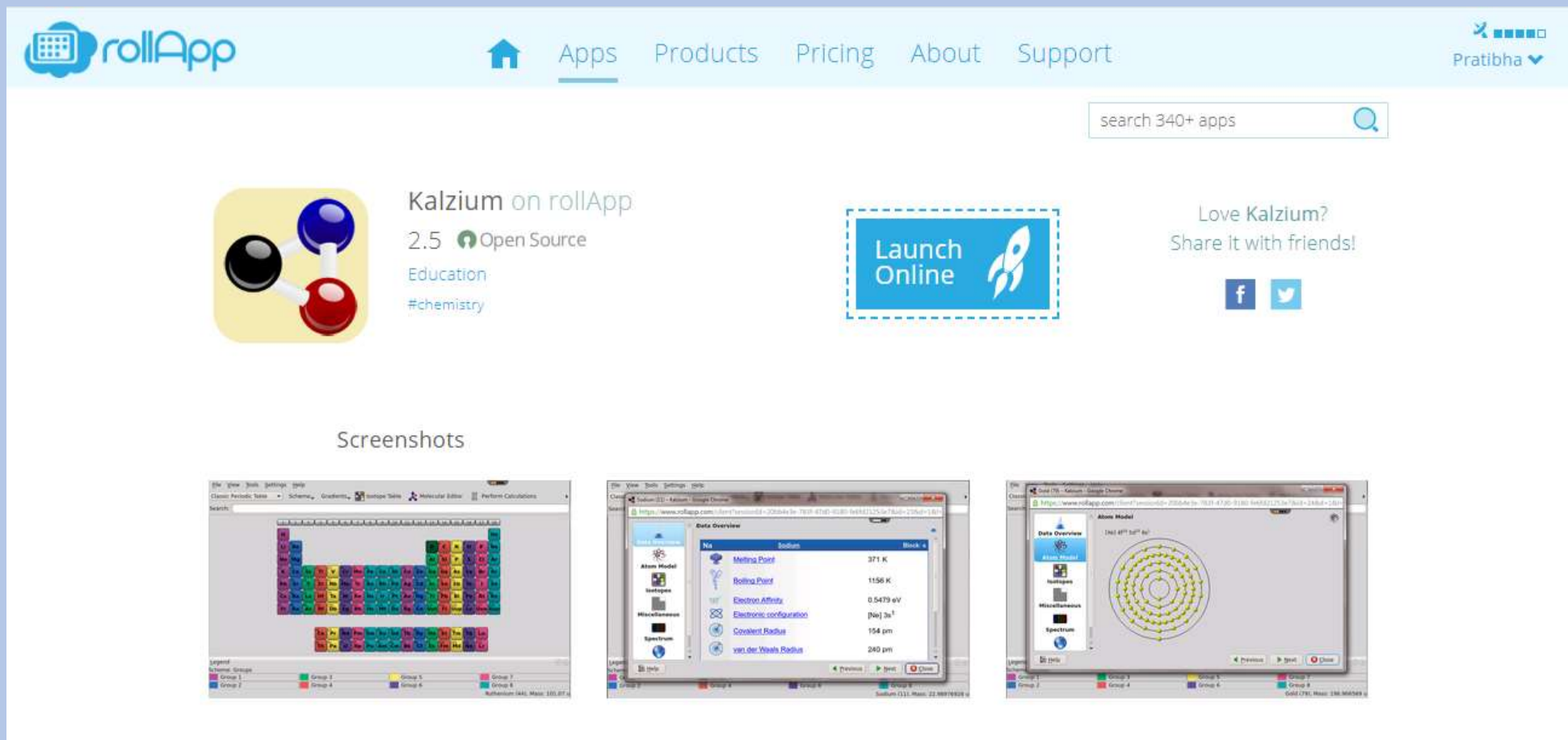
- **Kalzium (German for: Calcium) is a periodic table of the elements for KDE Software Compilation 4. KDE is an international free software community.**
- **Kalzium is a tool for Subject Specific Resource creation.**
- **Kalzium is an open source Chemistry Application for school and college students.**
- **Operating System UBUNTU**
- **Or Log on to [RollApp.com](http://RollApp.com)**

# How to download Kalzium

- Ubuntu
- Make a free account on RollApp – Kalzium is available free on RollApp.com



<https://www.rollapp.com/app/kalzium>





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Pratibha

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 **Kalzium** on rollApp  
2.5  Open Source  
Education  
#chemistry

[Launch Online](#)

Love Kalzium?  
Share it with friends!

Screenshots



Property	Value
Melting Point	371 K
Boiling Point	1156 K
Electron Affinity	0.5479 eV
Electronic configuration	3s <sup>1</sup>
Covalent Radius	154 pm
van der Waals Radius	240 pm



# KALZIUM



This software contains information about chemical elements:

- Mass
- Charge
- Picture
- Discovery information
- Chemical and energy data
- Model of the atom

# KALZIUM



- The table itself can be configured to display numeration, state of matter, and colour-coding in various ways.
- A date index is available, allowing only elements discovered up to a defined year to be shown.

# Information on each element – e.g. Hydrogen



Classic Periodic Table | Scheme | Gradients | Isotope Table... | Molecular Editor... | Perform Calculations... | Plot Data...

Information | Search:

Overview

## Hydrogen

$1\text{H}$

1.00794 u

View

Legend  
Scheme: Blocks

- s-Block
- p-Block
- d-Block
- f-Block

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18							
1 H																	2 He							
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne							
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar							
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr							
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe							
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn							
87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og							
		58 Ce										59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
		90 Th										91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

# Information on Gold



Classic Periodic Table | Scheme\_ Gradients\_ Isotope Table... Molecular Editor... Perform Calculations... Plot Data...

Information Overview Search:

**Gold**

79 **Au**

196.966569 u

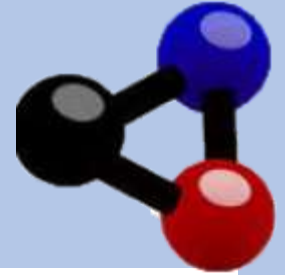
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 H																	2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og
		58 Ce 59 Pr 60 Nd 61 Pm 62 Sm 63 Eu 64 Gd 65 Tb 66 Dy 67 Ho 68 Er 69 Tm 70 Yb 71 Lu															
		90 Th 91 Pa 92 U 93 Np 94 Pu 95 Am 96 Cm 97 Bk 98 Cf 99 Es 100 Fm 101 Md 102 No 103 Lr															

View Legend Scheme: Blocks

- s-Block
- p-Block
- d-Block
- f-Block



# Information on Bromine



Information Search:

Overview

## Bromine

35 **Br**

79.904 u

View

Legend  
Scheme: Blocks

- s-Block
- p-Block
- d-Block
- f-Block

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 H																	2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og
			58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	
			90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr	

# Menu Bar

File View Tools Settings Help

Classic Periodic Table ▼

Scheme, Gradients, ▼

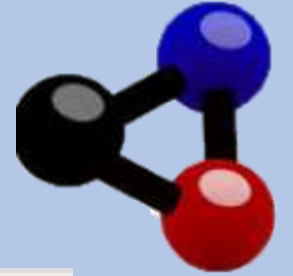
Information



Search:

Overview

CLICK ON VIEW



File   View   Tools   Settings   Help

Classic Periodic Table   Scheme.

Short Periodic Table   [🔍] (

Long Periodic Table

Transition Elements

DZ Periodic Table





# s-Block and p-Block



Short Periodic Table | Scheme | Gradients | Isotope Table... | Molecular Editor... | Perform Calculations... | Plot Data...

Information Search:

Overview

**Tin**

50 **Sn**

118.71 u

1	2	13	14	15	16	17	18
<sup>1</sup> H							<sup>2</sup> He
<sup>3</sup> Li	<sup>4</sup> Be	<sup>5</sup> B	<sup>6</sup> C	<sup>7</sup> N	<sup>8</sup> O	<sup>9</sup> F	<sup>10</sup> Ne
<sup>11</sup> Na	<sup>12</sup> Mg	<sup>13</sup> Al	<sup>14</sup> Si	<sup>15</sup> P	<sup>16</sup> S	<sup>17</sup> Cl	<sup>18</sup> Ar
<sup>19</sup> K	<sup>20</sup> Ca	<sup>31</sup> Ga	<sup>32</sup> Ge	<sup>33</sup> As	<sup>34</sup> Se	<sup>35</sup> Br	<sup>36</sup> Kr
<sup>37</sup> Rb	<sup>38</sup> Sr	<sup>49</sup> In	<sup>50</sup> Sn	<sup>51</sup> Sb	<sup>52</sup> Te	<sup>53</sup> I	<sup>54</sup> Xe
<sup>55</sup> Cs	<sup>56</sup> Ba	<sup>81</sup> Tl	<sup>82</sup> Pb	<sup>83</sup> Bi	<sup>84</sup> Po	<sup>85</sup> At	<sup>86</sup> Rn
<sup>87</sup> Fr	<sup>88</sup> Ra						

View

# Transition Elements



File View Tools Settings Help

Transition Elements Scheme Gradients Isotope Table... Molecular Editor... Perform Calculations... Plot Data...

Information Search:

Overview

## Molybdenum

42 **Mo**

95.96 u

3	4	5	6	7	8	9	10	11	12
<sup>21</sup> Sc	<sup>22</sup> Ti	<sup>23</sup> V	<sup>24</sup> Cr	<sup>25</sup> Mn	<sup>26</sup> Fe	<sup>27</sup> Co	<sup>28</sup> Ni	<sup>29</sup> Cu	<sup>30</sup> Zn
<sup>39</sup> Y	<sup>40</sup> Zr	<sup>41</sup> Nb	<sup>42</sup> Mo	<sup>43</sup> Tc	<sup>44</sup> Ru	<sup>45</sup> Rh	<sup>46</sup> Pd	<sup>47</sup> Ag	<sup>48</sup> Cd
<sup>57</sup> La	<sup>72</sup> Hf	<sup>73</sup> Ta	<sup>74</sup> W	<sup>75</sup> Re	<sup>76</sup> Os	<sup>77</sup> Ir	<sup>78</sup> Pt	<sup>79</sup> Au	<sup>80</sup> Hg
<sup>89</sup> Ac	<sup>104</sup> Rf	<sup>105</sup> Db	<sup>106</sup> Sg	<sup>107</sup> Bh	<sup>108</sup> Hs	<sup>109</sup> Mt	<sup>110</sup> Ds	<sup>111</sup> Rg	<sup>112</sup> Cn

View Legend

# SCHEME of PERIODIC TABLE



ole ▾ Scheme\_ Gradients\_ Isotope

- Monochrome
- Blocks
- Iconic
- Family
- Groups
- Colors



# Classic Periodic Table (Monochrome)



• Monochrome  
Blocks  
Iconic  
Family  
Groups  
Colors

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<sup>1</sup> H																	<sup>2</sup> He
<sup>3</sup> Li	<sup>4</sup> Be											<sup>5</sup> B	<sup>6</sup> C	<sup>7</sup> N	<sup>8</sup> O	<sup>9</sup> F	<sup>10</sup> Ne
<sup>11</sup> Na	<sup>12</sup> Mg											<sup>13</sup> Al	<sup>14</sup> Si	<sup>15</sup> P	<sup>16</sup> S	<sup>17</sup> Cl	<sup>18</sup> Ar
<sup>19</sup> K	<sup>20</sup> Ca	<sup>21</sup> Sc	<sup>22</sup> Ti	<sup>23</sup> V	<sup>24</sup> Cr	<sup>25</sup> Mn	<sup>26</sup> Fe	<sup>27</sup> Co	<sup>28</sup> Ni	<sup>29</sup> Cu	<sup>30</sup> Zn	<sup>31</sup> Ga	<sup>32</sup> Ge	<sup>33</sup> As	<sup>34</sup> Se	<sup>35</sup> Br	<sup>36</sup> Kr
<sup>37</sup> Rb	<sup>38</sup> Sr	<sup>39</sup> Y	<sup>40</sup> Zr	<sup>41</sup> Nb	<sup>42</sup> Mo	<sup>43</sup> Tc	<sup>44</sup> Ru	<sup>45</sup> Rh	<sup>46</sup> Pd	<sup>47</sup> Ag	<sup>48</sup> Cd	<sup>49</sup> In	<sup>50</sup> Sn	<sup>51</sup> Sb	<sup>52</sup> Te	<sup>53</sup> I	<sup>54</sup> Xe
<sup>55</sup> Cs	<sup>56</sup> Ba	<sup>57</sup> La	<sup>72</sup> Hf	<sup>73</sup> Ta	<sup>74</sup> W	<sup>75</sup> Re	<sup>76</sup> Os	<sup>77</sup> Ir	<sup>78</sup> Pt	<sup>79</sup> Au	<sup>80</sup> Hg	<sup>81</sup> Tl	<sup>82</sup> Pb	<sup>83</sup> Bi	<sup>84</sup> Po	<sup>85</sup> At	<sup>86</sup> Rn
<sup>87</sup> Fr	<sup>88</sup> Ra	<sup>89</sup> Ac	<sup>104</sup> Rf	<sup>105</sup> Db	<sup>106</sup> Sg	<sup>107</sup> Bh	<sup>108</sup> Hs	<sup>109</sup> Mt	<sup>110</sup> Ds	<sup>111</sup> Rg	<sup>112</sup> Cn	<sup>113</sup> Nh	<sup>114</sup> Fl	<sup>115</sup> Mc	<sup>116</sup> Lv	<sup>117</sup> Ts	<sup>118</sup> Og
			<sup>58</sup> Ce	<sup>59</sup> Pr	<sup>60</sup> Nd	<sup>61</sup> Pm	<sup>62</sup> Sm	<sup>63</sup> Eu	<sup>64</sup> Gd	<sup>65</sup> Tb	<sup>66</sup> Dy	<sup>67</sup> Ho	<sup>68</sup> Er	<sup>69</sup> Tm	<sup>70</sup> Yb	<sup>71</sup> Lu	
			<sup>90</sup> Th	<sup>91</sup> Pa	<sup>92</sup> U	<sup>93</sup> Np	<sup>94</sup> Pu	<sup>95</sup> Am	<sup>96</sup> Cm	<sup>97</sup> Bk	<sup>98</sup> Cf	<sup>99</sup> Es	<sup>100</sup> Fm	<sup>101</sup> Md	<sup>102</sup> No	<sup>103</sup> Lr	

82 u

# BLOCKS of PERIODIC TABLE



File View Tools Settings Help

Classic Periodic Table Scheme Gradients Isotope Table... Molecular Editor... Perform Calculations... Plot Data...

Information  
Overview

**Silver**

47 **Ag**

107.8682 u

View

Legend  
Scheme: Blocks

- s-Block
- p-Block
- d-Block
- f-Block

Monochrome

- Blocks
- Iconic
- Family
- Groups
- Colors

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 H																	2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
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			90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr	



# Each element is represented by an icon which represents its use (ICONIC VIEW)

File View Tools Settings Help

Classic Periodic Table Scheme Gradients Isotope Table... Molecular Editor... Perform Calculations... Plot Data...

Information Overview

- Monochrome
- Blocks
- Iconic
- Family
- Groups
- Colors

Mo

View





# Family in Periodic Table



Monochrome

Blocks

Iconic

• Family

Groups

Colors

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
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3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
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37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
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58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr



# Groups in Periodic table

- Monochrome
- Blocks
- Iconic
- Family
- Groups
- Colors

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
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90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

# Kalzium - Gradients



Gradients\_ Isotope Table... M

- None
- State of matter
- Covalent Radius
- van Der Waals
- Atomic Mass
- Boiling Point
- Melting Point
- Electronegativity (Pauling)
- Electronaffinity
- Discovery date
- First Ionization

# States of Matter

Classic Periodic Table | Scheme | Gradients | Isotope Table... | Molecular Editor... | Perform Calculations... | Plot Data...

Information Overview

## Rhodium

45 **Rh**

102.9055 u

- None
- State of matter
- Covalent Radius
- van Der Waals
- Atomic Mass
- Boiling Point
- Melting Point
- Electronegativity (Pauling)
- Electronaffinity
- Discovery date
- First Ionization

View

Legend

state of matter

<span style="color: red;">■</span> Solid	<span style="color: green;">■</span> Vaporous
<span style="color: blue;">■</span> Liquid	<span style="color: gray;">■</span> Unknown

Scheme: Colors

Nice colors without meaning. (Fr









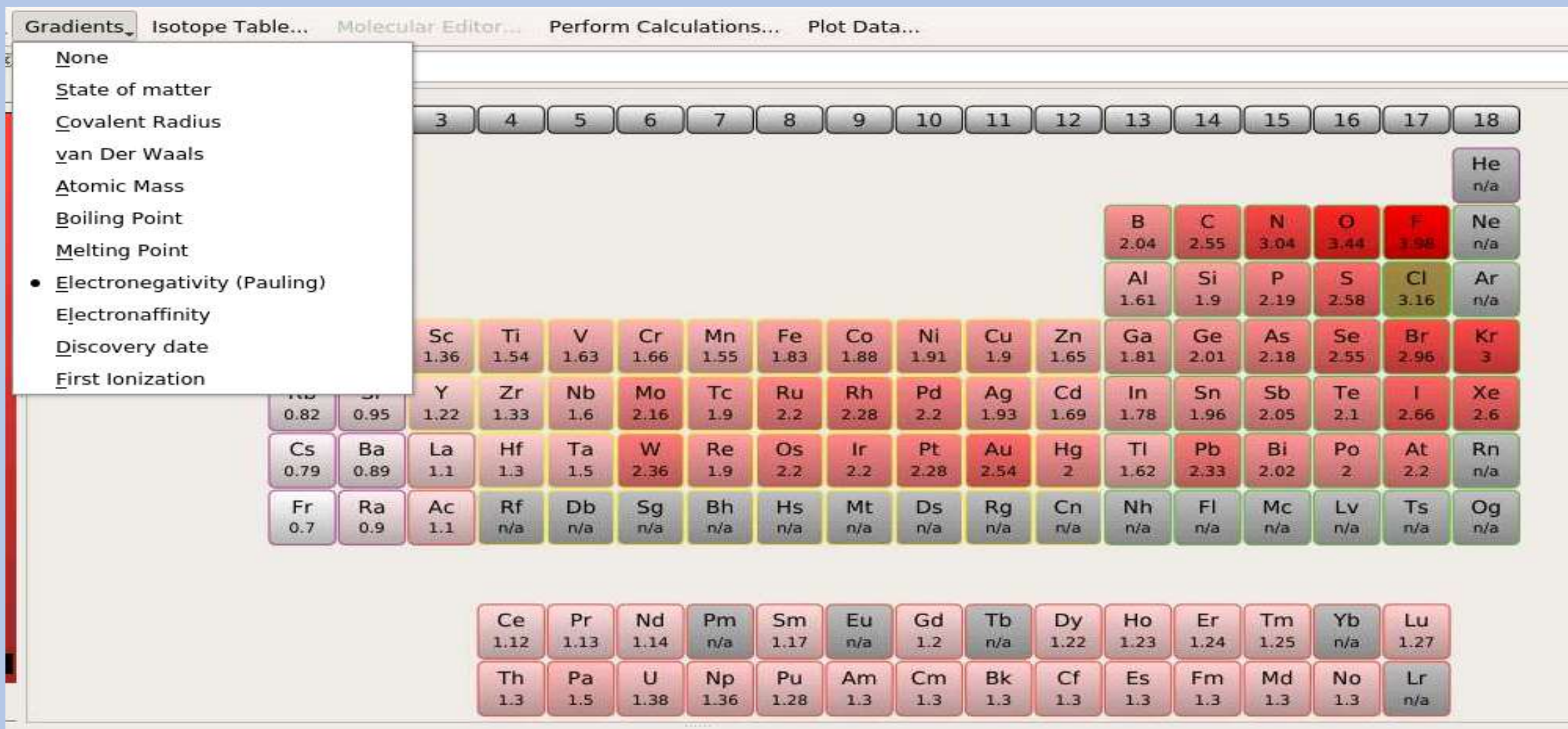








# Electronegativity (Pauling scale)















# Double Click on an element

A periodic table of elements is displayed. The element Iron (Fe) is highlighted with a yellow background and a white border. The atomic number 3023 is shown below the element symbol. The table includes elements from Hydrogen (H) to Oganesson (Og), with the Lanthanide and Actinide series shown below the main table.

H 1 1.008																	He 2 4.003
Li 3 6.941	Be 4 9.012											B 5 10.811	C 6 12.011	N 7 14.007	O 8 15.999	F 9 18.998	Ne 10 20.180
Na 11 22.990	Mg 12 24.305											Al 13 26.982	Si 14 28.086	P 15 30.974	S 16 32.065	Cl 17 35.453	Ar 18 39.948
K 19 39.098	Ca 20 40.078	Sc 21 44.956	Ti 22 47.883	V 23 50.942	Cr 24 52.004	Mn 25 54.938	Fe 26 55.845	Co 27 58.933	Ni 28 58.693	Cu 29 63.546	Zn 30 65.38	Ga 31 69.723	Ge 32 72.64	As 33 74.922	Se 34 78.96	Br 35 79.904	Kr 36 83.80
Rb 37 85.468	Sr 38 87.62	Y 39 88.906	Zr 40 91.224	Nb 41 92.906	Mo 42 95.94	Tc 43 98.906	Ru 44 101.07	Rh 45 102.91	Pd 46 106.42	Ag 47 107.87	Cd 48 112.41	In 49 114.82	Sn 50 118.71	Sb 51 121.76	Te 52 127.6	I 53 126.91	Xe 54 131.29
Cs 55 132.91	Ba 56 137.33	La 57 138.91	Hf 58 178.49	Ta 59 180.95	W 60 183.85	Re 61 186.21	Os 62 190.23	Ir 63 192.22	Pt 64 195.08	Au 65 196.97	Hg 66 200.59	Tl 67 204.38	Pb 68 207.2	Bi 69 208.98	Po 70 n/a	At 71 n/a	Rn 72 n/a
Fr 73 n/a	Ra 74 n/a	Ac 75 n/a	Rf 76 n/a	Db 77 n/a	Sg 78 n/a	Bh 79 n/a	Hs 80 n/a	Mt 81 n/a	Ds 82 n/a	Rg 83 n/a	Cn 84 n/a	Nh 85 n/a	Fl 86 n/a	Mc 87 n/a	Lv 88 n/a	Ts 89 n/a	Og 90 n/a
Ce 58 140.12	Pr 59 140.91	Nd 60 144.24	Pm 61 n/a	Sm 62 150.36	Eu 63 151.96	Gd 64 157.25	Tb 65 158.93	Dy 66 162.50	Ho 67 164.93	Er 68 167.26	Tm 69 168.93	Yb 70 173.05	Lu 71 174.97				
Th 82 232.04	Pa 83 231.04	U 84 238.03	Np 85 n/a	Pu 86 n/a	Am 87 n/a	Cm 88 n/a	Bk 89 n/a	Cf 90 n/a	Es 91 n/a	Fm 92 n/a	Md 93 n/a	No 94 n/a	Lr 95 n/a				











# Double Click on an Element – Data Overview

- Melting Point
- Boiling Point
- Electron Affinity
- Electronic Configuration
- Covalent Radius
- Van der Waals Radius
- Atomic Radius
- First Ionization Energy
- Electronegativity
- Oxidation States

# Double-click on Fe

Fe	Iron	
	<u>Melting Point</u>	1808 K
	<u>Boiling Point</u>	3023 K
	<u>Electron Affinity</u>	0.151 eV
	<u>Electronic configuration</u>	[Ar] 3d <sup>6</sup> 4s <sup>2</sup>
	<u>Covalent Radius</u>	125 pm
	<u>van der Waals Radius</u>	205 pm
	<u>Atomic mass</u>	55.845 u
	<u>First Ionization energy</u>	7.902 eV
	<u>Electronegativity</u>	1.83
	<u>Oxidation states</u>	6, 3, 2, 0, -2

# Double-click on Chromium

Data Overview	Data Overview		
Atom Model	Cr	Chromium	Block: d
Isotopes		<a href="#">Melting Point</a>	2130 K
Miscellaneous		<a href="#">Boiling Point</a>	2945 K
Spectrum		<a href="#">Electron Affinity</a>	0.6758 eV
Extra information		<a href="#">Electronic configuration</a>	[Ar] 3d <sup>5</sup> 4s <sup>1</sup>
		<a href="#">Covalent Radius</a>	127 pm
		<a href="#">van der Waals Radius</a>	205 pm
		<a href="#">Atomic mass</a>	51.9961 u
		<a href="#">First Ionization energy</a>	6.767 eV
		<a href="#">Electronegativity</a>	1.66
		<a href="#">Oxidation states</a>	6, 3, 2, 0

# Atomic Model

Data Overview

Atom Model

Isotopes

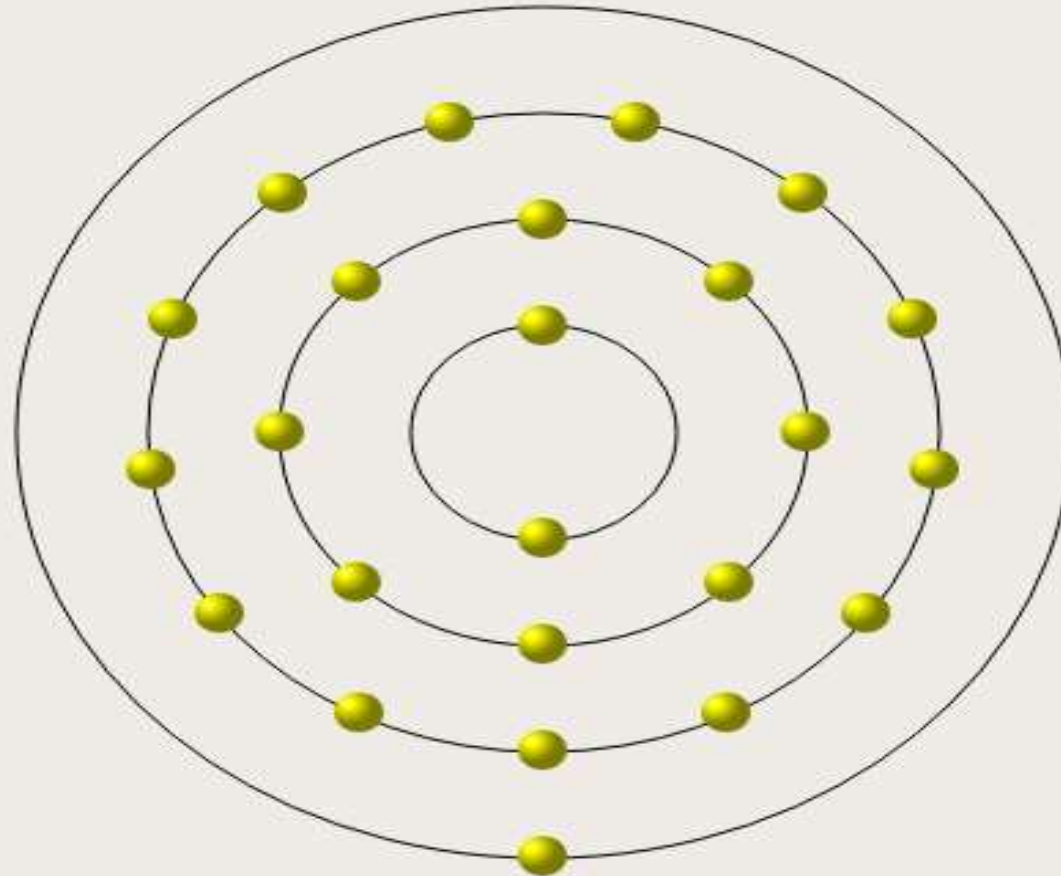
Miscellaneous

Spectrum

Extra information

Atom Model

[Ar] 3d<sup>5</sup> 4s<sup>1</sup>









# Isotopes of Chromium

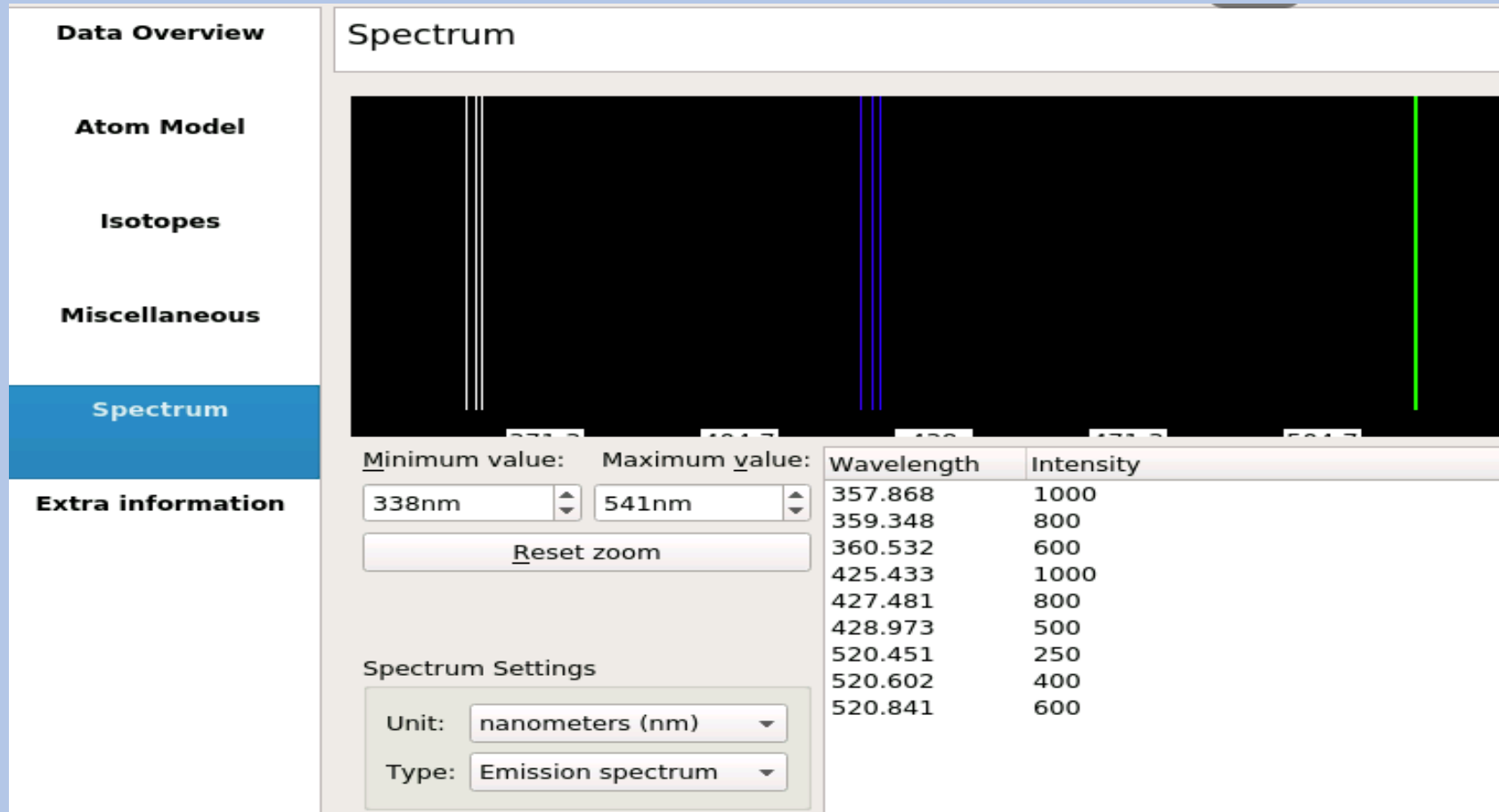
<b>Data Overview</b>	Isotopes						
<b>Atom Model</b>	Cr <u>Chromium</u>						Block: d
<b>Isotopes</b>	Isotope-Table						
<b>Miscellaneous</b>	<b>Mass</b>	<b>Neutrons</b>	<b>Percentage</b>	<b>Half-life period</b>	<b>Energy and Mode of Decay</b>	<b>Spin and Parity</b>	<b>Magnetic Moment</b>
<b>Spectrum</b>	42.0064 u	18					
<b>Extra information</b>	42.9977 u	19		0.021 s			
	43.9856 u	20		0.053 s			
	44.9796 u	21		0.05 s			
	45.9684 u	22		0.26 s			
	46.9629 u	23		0.5 s			
	47.954 u	24		77616 s			
	48.9512						



# Miscellaneous Information

<b>Data Overview</b>	Miscellaneous									
<b>Atom Model</b>										
<b>Isotopes</b>										
<b>Miscellaneous</b>	<table><tr><td><b>Cr</b></td><td><u>Chromium</u></td><td>Block: d</td></tr><tr><td></td><td colspan="2">This element was discovered in the year 1797. It was discovered by Nicholas Louis Vauquelin.</td></tr><tr><td></td><td colspan="2">Origin of the name: Greek 'chroma' means 'color'</td></tr></table>	<b>Cr</b>	<u>Chromium</u>	Block: d		This element was discovered in the year 1797. It was discovered by Nicholas Louis Vauquelin.			Origin of the name: Greek 'chroma' means 'color'	
<b>Cr</b>	<u>Chromium</u>	Block: d								
	This element was discovered in the year 1797. It was discovered by Nicholas Louis Vauquelin.									
	Origin of the name: Greek 'chroma' means 'color'									

# Spectrum of Chromium



View Tools Settings Help

- Tables
- Numeration**
- Scheme
- Gradients
- Legend
- Information
- Table Information

- Gradients
- Isotope Table...
- Molecular Editor...
- Perform Calculations...
- Plot Data...
- No Numeration
- IUPAC**
- CAS
- Old IUPAC

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

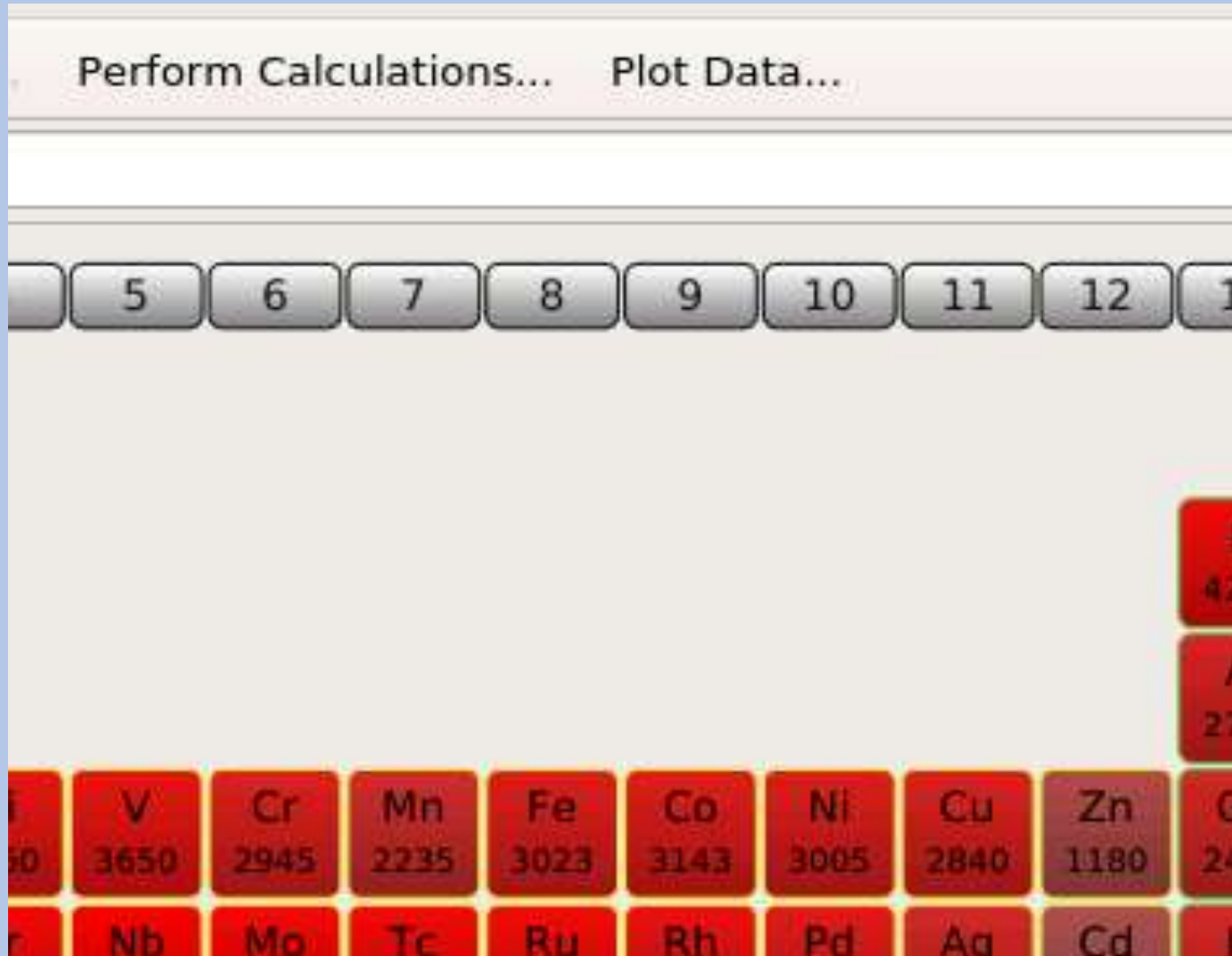
H 20.28																He 4.216	
Li 6.941	Be 9.012										B 10.81	C 12.01	N 14.01	O 15.99	F 18.99	Ne 20.18	
Na 22.99	Mg 24.31										Al 26.98	Si 28.09	P 30.97	S 32.06	Cl 35.45	Ar 39.95	
K 39.10	Ca 40.08	Sc 44.96	Ti 47.88	V 50.94	Cr 52.00	Mn 54.94	Fe 55.85	Co 58.93	Ni 58.71	Cu 63.55	Zn 65.38	Ga 69.72	Ge 72.64	As 74.92	Se 78.96	Br 79.90	Kr 83.80
Rb 85.47	Sr 87.62	Y 88.91	Zr 91.22	Nb 92.91	Mo 95.94	Tc 98.91	Ru 101.07	Rh 102.91	Pd 106.42	Ag 107.87	Cd 112.41	In 114.82	Sn 118.71	Sb 121.76	Te 127.60	I 126.91	Xe 131.29
Cs 132.91	Ba 137.33	La 138.91	Hf 178.49	Ta 180.95	W 183.84	Re 186.21	Os 190.23	Ir 192.22	Pt 195.08	Au 196.97	Hg 200.59	Tl 204.38	Pb 207.2	Bi 208.98	Po n/a	At 210	Rn 222
Fr 223	Ra 226	Ac 227	Rf n/a	Db n/a	Sg n/a	Bh n/a	Hs n/a	Mt n/a	Ds n/a	Rg n/a	Cn n/a	Nh n/a	Fl n/a	Mc n/a	Lv n/a	Ts n/a	Og n/a

116 Lv

293 u

Ce 140.12	Pr 140.91	Nd 144.24	Pm 145	Sm 150.36	Eu 151.96	Gd 157.25	Tb 158.93	Dy 162.50	Ho 164.93	Er 167.26	Tm 168.93	Yb 173.05	Lu 174.97
Th 232.04	Pa 231.04	U 238.03	Np 237.05	Pu 244.06	Am 243.06	Cm 247.07	Bk 247.07	Cf 251.08	Es n/a	Fm n/a	Md n/a	No n/a	Lr n/a

# Menu Bar - Perform Calculations





# The Kalzium Calculators

- Molecular Mass Calculator
- Concentration Calculator
- Nuclear Calculator
- Gas Calculator
- Equation Balancer
- Titration Calculator



# The Kalzium Calculators



Calculators

Introduction

Molecular mass Calculator

Concentration Calculator

Nuclear Calculator

Gas Calculator

Titration Calculator

Equation Balancer

## The Kalzium Calculators

This calculator contains a variety of calculators for different tasks performing different calculations.

You can find the following calculators in Kalzium:

- **Molecular mass calculator**

This calculator helps you calculate the molecular masses of different molecules.

You can specify short form of the molecule names add more such aliases.

- **Concentrations calculator**

You can calculate quantities which include:

- Amount of substance
- Volume of solvent
- Concentration of substance

There are a wide range of units to choose from and different methods to specify quantities.

- **Nuclear calculator**

This calculator makes use of the nuclear data available in Kalzium to predict the expected masses of a material after time.

- **Gas calculator**

This calculator can calculate the values of Temperature, pressure, volume, amount of gas etc. for various ideal as well as non-ideal gases.

- **Equation Balancer**

This calculator can balance chemical equations.

- **Titration calculator**

This calculator tries to find out the equivalence point of a pH-meter followed titration best fitting it with an hyperbolic tangent. You can also let it solve an equilibrium system of equations and see how the concentration of a species changes in function of another one.

# Molecular Mass Calculator



H2SO4

H<sub>2</sub> S<sub>1</sub> O<sub>4</sub>

Molecular mass: 98.0785 u

## Details

### Composition

	Element	Atoms	Atomic mass	Total mass	Percentage
1	Hydrogen	2	1.00794	2.01588	2.05537
2	Sulfur	1	32.065	32.065	32.6932
3	Oxygen	4	15.9994	63.9976	65.2514

### Aliases used

aliases

# Concentration Calculator



<b>Calculate:</b>	<input type="text"/>		
<b>Amount of solute:</b>	<input type="text" value="117.0000"/>	<input type="text" value="grams (g)"/>	<input type="text" value="Mass"/>
<b>Molar mass of solute:</b>	<input type="text" value="58.5000"/>	<input type="text" value="(g/mol)"/>	
<b>Equivalent mass of solute:</b>	<input type="text" value="58.5000"/>	<input type="text" value="(g/mole)"/>	
<b>Density of solute:</b>	<input type="text" value="2.7000"/>	<input type="text" value="grams per liter"/>	
<b>Amount of Solvent:</b>	<input type="text" value="1.0000"/>	<input type="text" value="liters (l)"/>	<input type="text" value="Volume"/>
<b>Molar mass of solvent:</b>	<input type="text" value="18.0000"/>	<input type="text" value="(g/mole)"/>	
<b>Density of Solvent:</b>	<input type="text" value="1000.0000"/>	<input type="text" value="grams per liter"/>	
<b>Concentration:</b>	<input type="text" value="2.0000"/>	<input type="text" value="molar"/>	



# Nuclear Calculator

<b>Element Name:</b>	Uranium	
<b>Isotope mass:</b>	239.054	
<b>Half-life:</b>	1407.0000	year (y)
<b>Atomic mass:</b>	239.054	grams / mole
Other data		
<b>Calculate:</b>	Time	
<b>Initial amount:</b>	6.0000	grams (g)
<b>Final amount:</b>	3.0000	grams (g)
<b>Time:</b>	1407.0000	year (y)

# Gas Calculator

Data

**Calculate:**

**Molar mass of the gas:**

2.0080

(g/mol)

**Moles:**

1.0000

**Mass:**

2.0160

grams (g)

**Pressure:**

1.0000

atmospheres (atm)

**Temperature:**

273.0000

kelvins (K)

**Volume:**

22.4024

liters (l)

# Titration Calculator

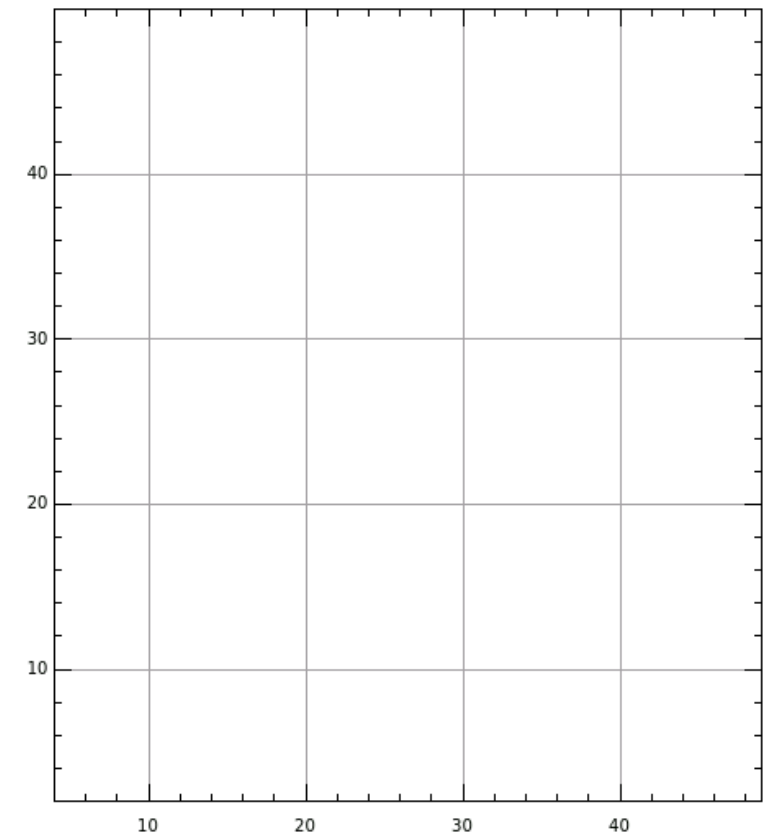
Experimental values    Theoretical equations

Find the equivalence point from experimental values:

	pH(Y)	Volume(X)
1		
2		
3		
4		
5		
6		
7		
8		

Draw Plot

Notes:



# Equation Balancer

Equation:

aCH<sub>3</sub>(CH<sub>2</sub>)<sub>3</sub>COOH + bO<sub>2</sub> -> cH<sub>2</sub>O + dCO<sub>2</sub>

Calculate

Enter the equation you want to balance in this field.

Copy to Clipboard

The equation solver allows you to balance a chemical equation.

## Using Variables

To express variable quantities of an element, put a single character in front of the element's symbol, as shown in this example:

$aH + bO \rightarrow 5H_2O$  (Result: **10** H + **5** O -> **5** H<sub>2</sub>O)

Solving this expression will give you the needed amount of Hydrogen and Oxygen.

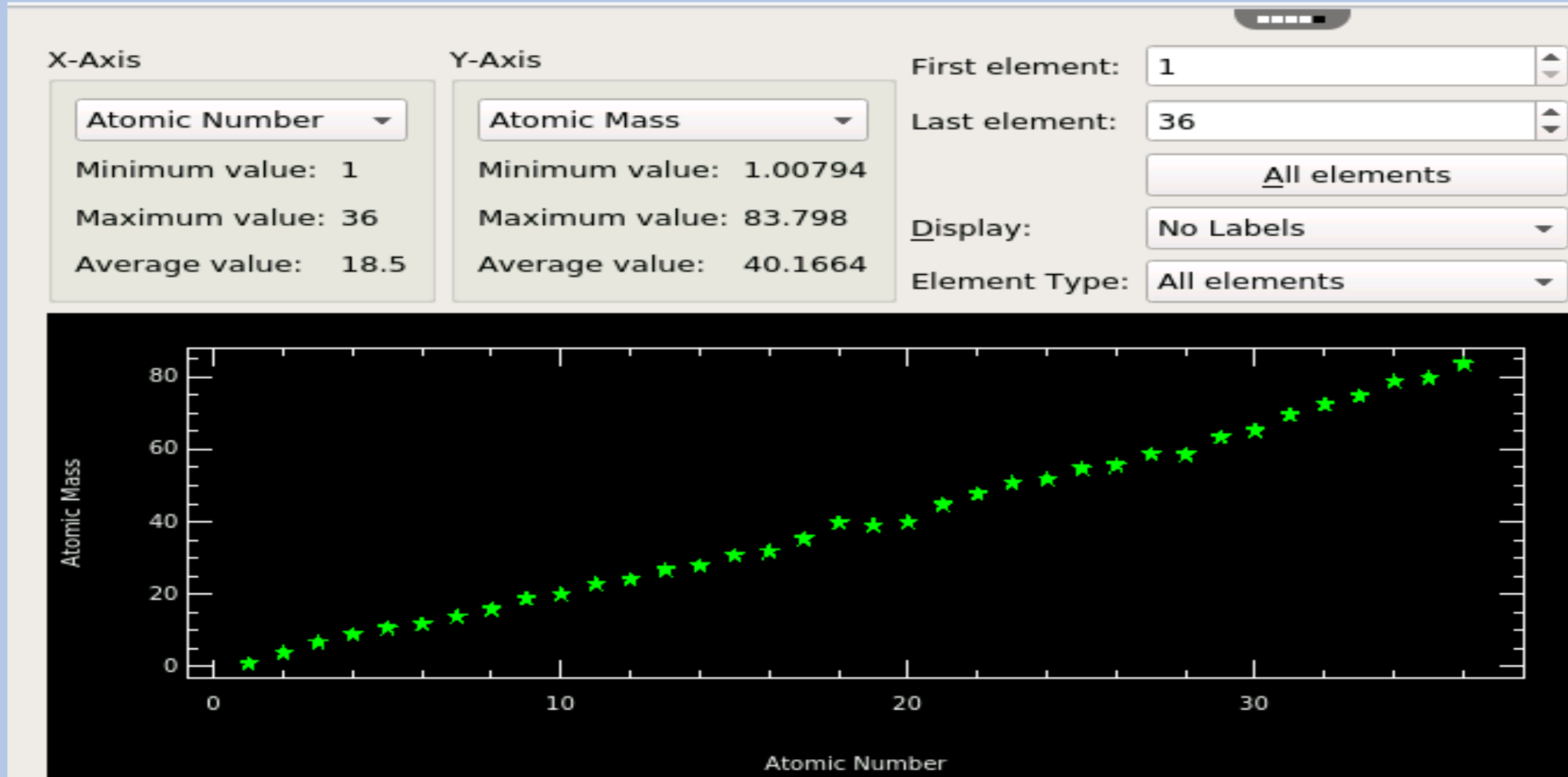
## Defining electric charges

Use box brackets to specify the electric charge of an element, as shown in this example:

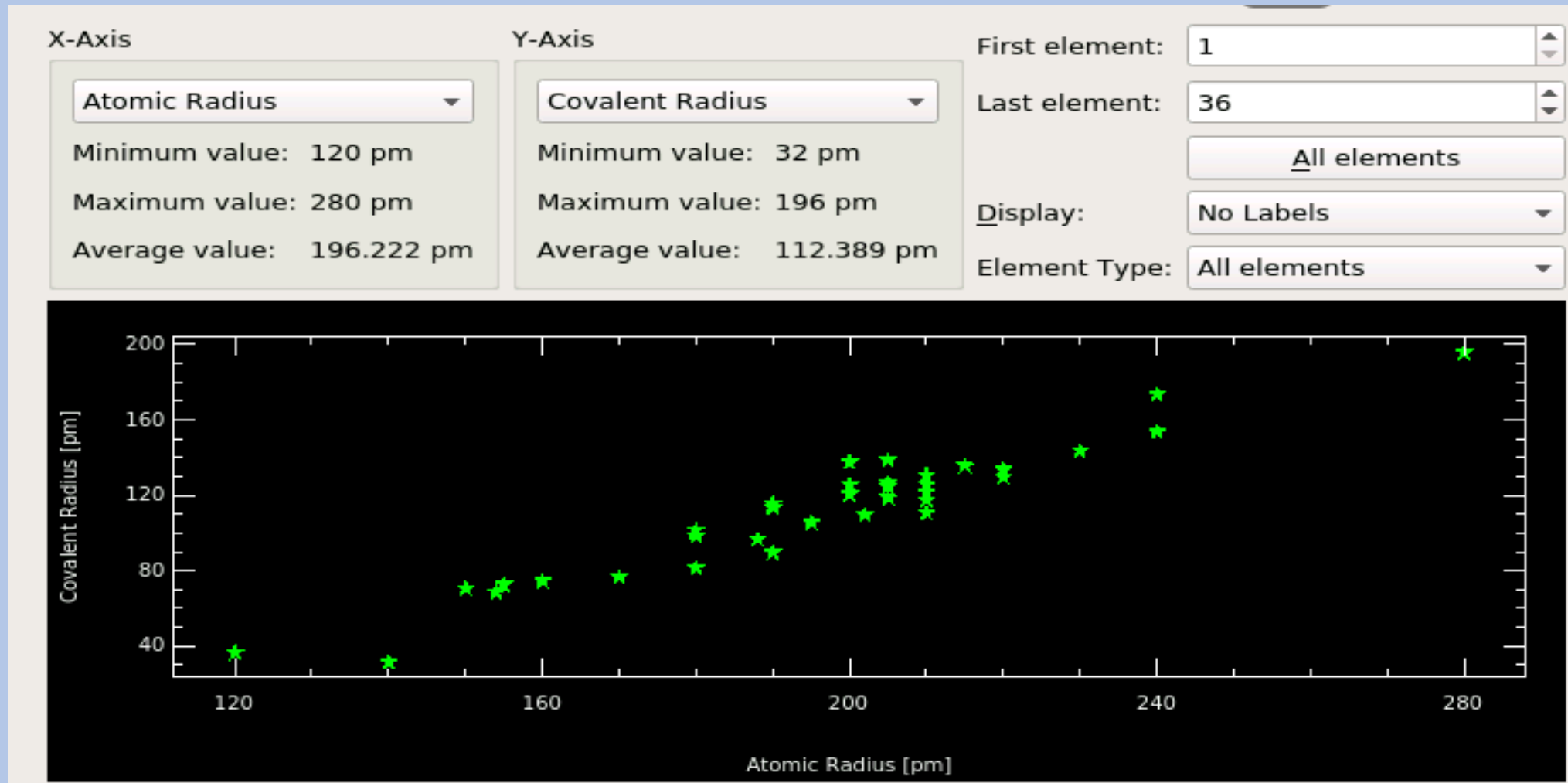
$4H[+] + 2O \rightarrow cH_2O[2+]$  (Result: **4** H<sup>+</sup> + **2** O -> **2** H<sub>2</sub>O<sup>2+</sup>)



# Plot Data – Atomic Number vs Atomic Mass



# Plot Data – Atomic Radius vs Covalent Radius





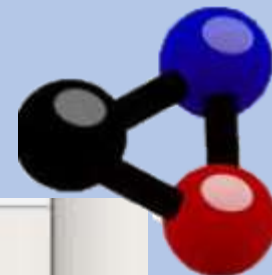
# Numeric Prefixes



Greek alphabet	Numeric Prefixes and Roman Numerals		
Numbers	Number	Prefix	Roman Numerals
	0.5	hemi	
	1	mono	I
	1.5	sesqui	
	2	di, bi	II
	2.5	hemipenta	
	3	tri	III
	4	tetra	IV
	5	penta	V
	6	hexa	VI
	7	hepta	VII
	8	octa	VIII
	9	nona, ennea	IX
	10	deca	X
	11	hendeca, undeca	XI
	12	dodeca	XII
	13	trideca	XIII
	14	tetradeca	XIV
	15	pentadeca	XV



# Risk & Safety Phrases



9 - Explosive when mixed with combustibile material

## S-Phrases:

- 1 - Keep locked up
- 2 - Keep out of the reach of children
- 3 - Keep in a cool place
- 4 - Keep away from living quarters
- 5 - Keep contents under ... ( appropriate liquid to be specified by the manufacturer )
- 6 - Keep under ... ( inert gas to be specified by the manufacturer )
- 7 - Keep container tightly closed
- 8 - Keep container dry
- 9 - Keep container in a well-ventilated place

R-Phrases: 1-2-3-4-5-6-7-8-9

S-Phrases: 1-2-3-4-5-6-7-8-9

Filter

Close

Help

# Risk & Safety Phrases



## R-Phrases:

- 1 - Explosive when dry
- 2 - Risk of explosion by shock, friction, fire or other sources of ignition
- 3 - Extreme risk of explosion by shock, friction, fire or other sources of ignition
- 4 - Forms very sensitive explosive metallic compounds
- 5 - Heating may cause an explosion
- 6 - Explosive with or without contact with air
- 7 - May cause fire
- 8 - Contact with combustible material may cause fire
- 9 - Explosive when mixed with combustible material

## S-Phrases:

R-Phrases: 1-2-3-4-5-6-7-8-9

S-Phrases: 1-2-3-4-5-6-7-8-9

Filter

Close

Help

# References

- [https://teacher-network.in/OER/index.php/Learn Kalzium](https://teacher-network.in/OER/index.php/Learn_Kalzium)
- <https://www.youtube.com/watch?v=6XutQzXCBSw>
- [https://www.youtube.com/watch?v=8\\_4x4OQNgVc](https://www.youtube.com/watch?v=8_4x4OQNgVc)
- <https://kde.org/applications/en/education/org.kde.kalzium>
- [https://teacher-network.in/OER/index.php/Learn Kalzium#From Software center](https://teacher-network.in/OER/index.php/Learn_Kalzium#From_Software_center)
- <https://kde.org/applications/en/education/org.kde.kalzium>
- <https://chemistry-europe.onlinelibrary.wiley.com/doi/10.1002/ejic.201801409>