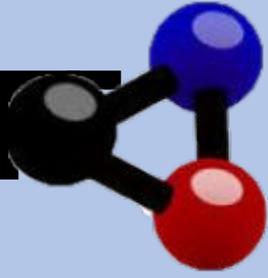


कैल्शियम के साथ रसायन विज्ञान का अन्वेषण



Explore Chemistry with Kalzium

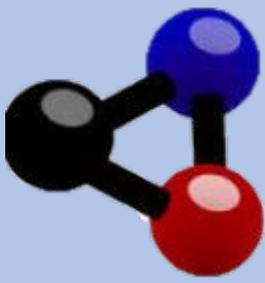
डॉ. प्रतिभा कोहली

सी.बी.एस.ई. शिक्षक पुरस्कार 2018-19

शिक्षा में नवाचार पद्धतियों और प्रयोगों पर विद्यालयों और अध्यापक शिक्षा संस्थानों के लिए राष्ट्रीय पुरस्कार 2018-19

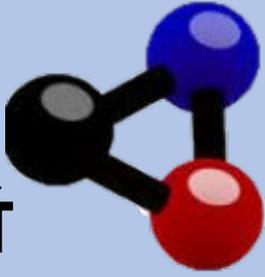
राजकीय शिक्षक पुरस्कार - 2015

आधुनिक आवर्त सारणी Modern Periodic Table



- तत्वों को आवर्त सारणी के रूप में व्यवस्थित किया गया है
(परमाणु क्रमांक (Atomic Number) के आधार पर)
- तत्वों का व्यवस्थित समूहन (grouping) 4 ब्लॉक में किया गया है – s ब्लॉक, p ब्लॉक, d ब्लॉक और f ब्लॉक
- आवर्त सारणी में तत्वों के स्थान से उसके गुणों का अनुमान आसानी से लगाया जा सकता है और उसकी तुलना दूसरे तत्वों से की जा सकती है ।

IYPT 2019

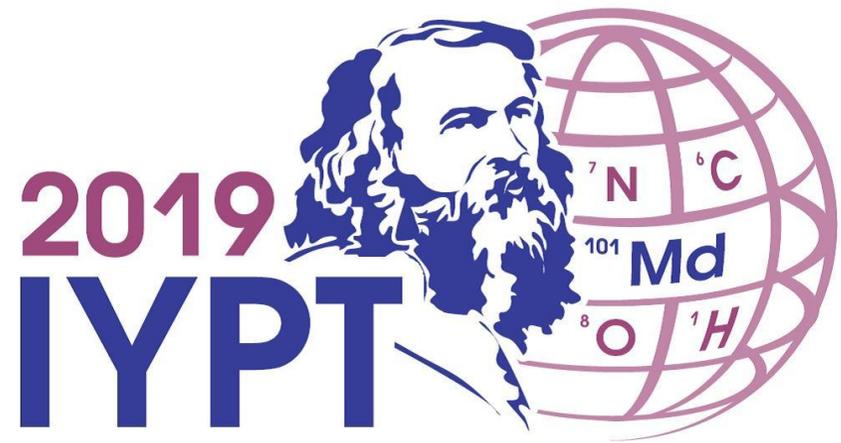
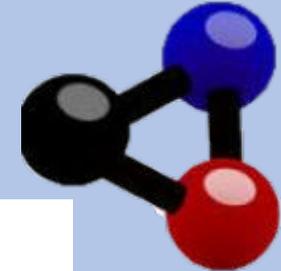


- **रासायनिक तत्वों** की आवर्त सारणी विज्ञान की सबसे महत्वपूर्ण उपलब्धियों में से एक है | यह केवल विज्ञान के सार को ही नहीं बल्कि रसायन विज्ञान, भौतिकी, जीव विज्ञान, चिकित्सा, पृथ्वी विज्ञान और विज्ञान के अन्य क्षेत्रों को भी सम्मिलित करता है |
- आवर्त सारणी की खोज 1869 में की गई और रूस के वैज्ञानिक मेंडेलीव का इसमें महत्वपूर्ण योगदान था | 2019 में रासायनिक तत्वों के आवर्त सारणी की 150^{वीं} शताब्दी मनाई गई और इसीलिए संयुक्त राष्ट्र महासभा (United Nations General Assembly) और यूनेस्को (UNESCO) ने इसे **“रासायनिक तत्वों के आवर्त सारणी का अंतरराष्ट्रीय वर्ष”** (“International Year of the Periodic Table of Chemical Elements (IYPT2019)”) घोषित किया |

2019

IYPT



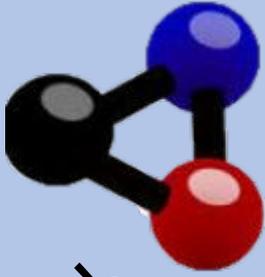


49 In Indium 114.818	52 Te Tellurium 127.603	R	11 Na Sodium 22.989	22 Ti Titanium 47.867	8 O Oxygen 15.999	7 N Nitrogen 14.007	13 Al Aluminium 26.981	39 Y Yttrium 88.905	E	18 Ar Argon 39.948	8 O Oxygen 15.999	9 F Fluorine 18.998	T	2 He Helium 4.003
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15 P Phosphorus 30.974	68 Er Erbium 167.259	53 I Iodine 126.904	8 O Oxygen 15.999	Di	6 C Carbon 12.011	73 Ta Tantalum 180.948	5 B Boron 10.811	Le
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2 0 1 9

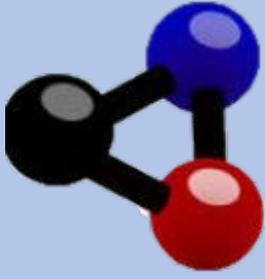
कैलज़ियम



- कैलज़ियम (कैल्शियम का जर्मन नाम) - तत्वों का आवर्त सारणी है जो KDE सॉफ्टवेयर कंपाइलेशन द्वारा निर्मित है | KDE एक अंतर्राष्ट्रीय फ्री सॉफ्टवेयर बनाने वाला समुदाय है |
- कैलज़ियम विषय विशिष्ट संसाधन निर्माण करने का एक उपकरण है।
- कैलज़ियम स्कूल और कॉलेज के छात्रों के लिए रसायन विज्ञान का एक मुक्त स्रोत सॉफ्टवेयर है।
- कैलज़ियम सॉफ्टवेयर को Ubuntu Linux (मुक्त स्रोत ऑपरेटिंग सिस्टम) पर चलाया जा सकता है।

या

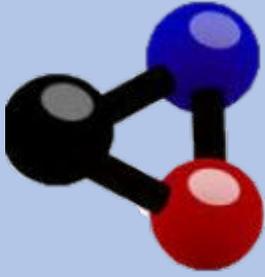
RollApp.com पर लॉगिन करें



कैलज़ियम कैसे डाउनलोड करें

- Ubuntu Linux (मुक्त स्रोत ऑपरेटिंग सिस्टम) पर इनस्टॉल करें
- RollApp.com पर निः शुल्क अकाउंट बनाएं और कैलज़ियम को निः शुल्क में इस्तेमाल करें





लिंक

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



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Pratibha

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Kalzium on rollApp

2.5 Open Source

Education

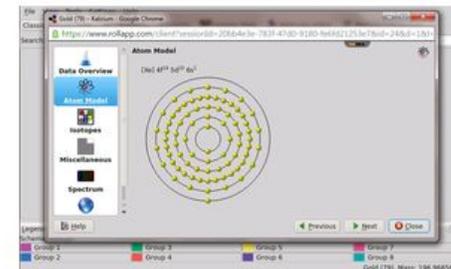
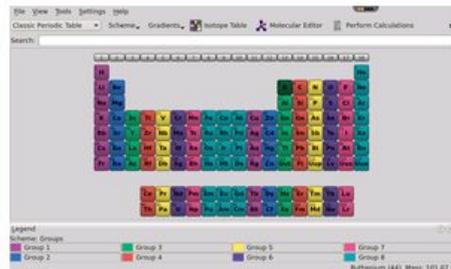
#chemistry



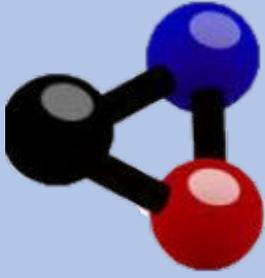
Love Kalzium?
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Screenshots

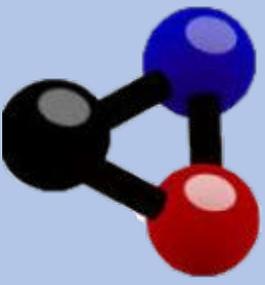


कैल्शियम Kalzium



- कैल्शियम सॉफ्टवेयर में तत्वों के विषय में जानकारी उपलब्ध है, जिसमें उसका:
 - द्रव्यमान (mass)
 - रासायनिक डेटा
 - खोज जानकारी
 - एटम का मॉडल (atomic model) इत्यादि शामिल हैं ।
- यह तत्वों का ज्ञान प्राप्त करने या तत्वों का पता लगाने के लिए एक उत्कृष्ट संसाधन है।

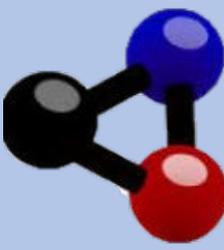
कैल्शियम Kalzium



- आवर्त सारणी की कलर कोडिंग (colour coding) विभिन्न तरीकों से की जा सकती है जिससे तत्वों गुणों में प्रवृत्तियों का अध्ययन किया जा सके ।
- इसमें दिनांक सूचकांक भी दिया गया है जिससे सिर्फ उन तत्वों का अध्ययन किया जा सकता है - जिनकी खोज चुनी हुई तारीख तक हुई है।

प्रत्येक तत्व की जानकारी - उदाहरण (हाइड्रोजन (H))

Hydrogen (H)



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

Information | Search:

Overview

Hydrogen

1H

1.00794 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																	

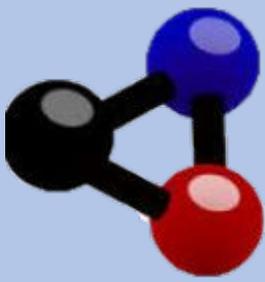
View

Legend
Scheme: Blocks

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

गोल्ड (Au) - तत्व की जानकारी

Gold (Au)



Classic Periodic Table | Scheme_ | Gradients_ | Isotope Table... | Molecular Editor... | Perform Calculations... | Plot Data...

Information | Search:

Overview

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

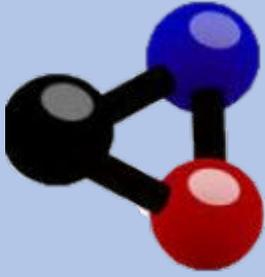
Legend

Scheme: Blocks

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

ब्रोमिन(Br) - तत्व की जानकारी

Information on Bromine(Br)



Information Search:

Overview

Bromine

35 **Br**

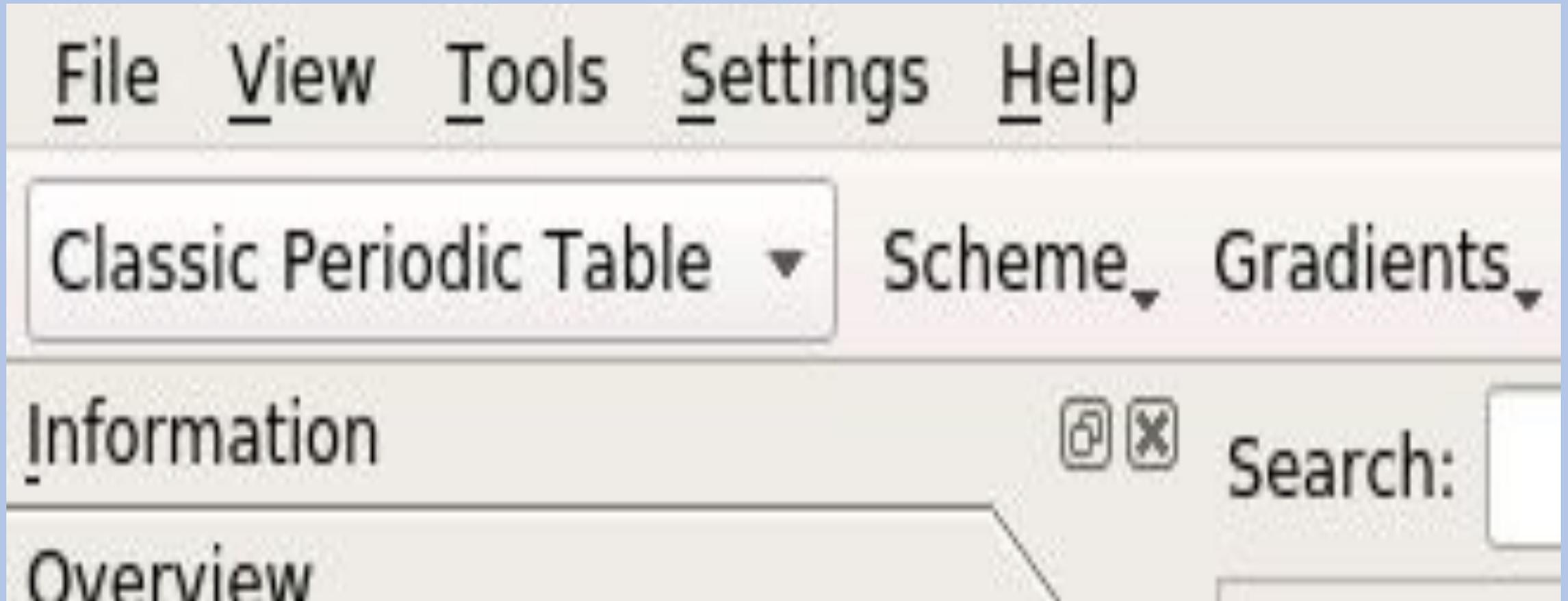
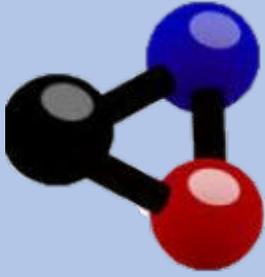
79.904 u

View

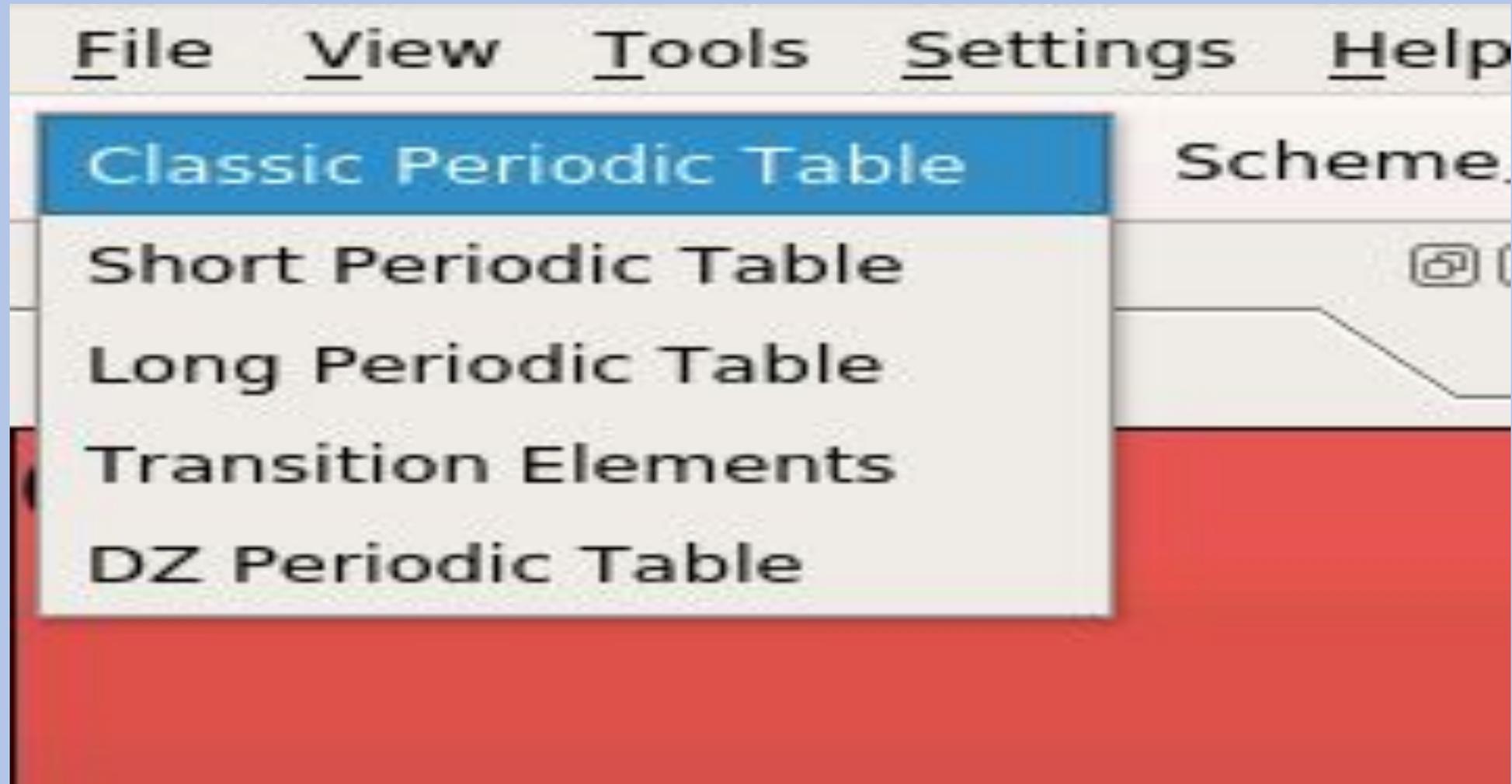
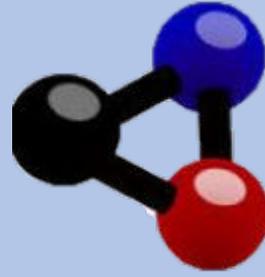
Legend
Scheme: Blocks

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

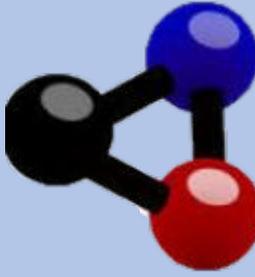
मेनू बार Menu Bar



व्यू (VIEW) पर क्लिक करें
CLICK ON VIEW



मुख्य वर्ग के तत्व s-ब्लॉक और p-ब्लॉक



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

Information | Search:

Overview

Tin

50 **Sn**

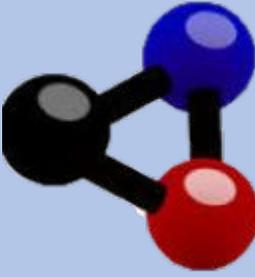
118.71 u

1	2	13	14	15	16	17	18
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	³¹ Ga	³² Ge	³³ As	³⁴ Se	³⁵ Br	³⁶ Kr
³⁷ Rb	³⁸ Sr	⁴⁹ In	⁵⁰ Sn	⁵¹ Sb	⁵² Te	⁵³ I	⁵⁴ Xe
⁵⁵ Cs	⁵⁶ Ba	⁸¹ Tl	⁸² Pb	⁸³ Bi	⁸⁴ Po	⁸⁵ At	⁸⁶ Rn
⁸⁷ Fr	⁸⁸ Ra						

View

संक्रमण तत्व

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**

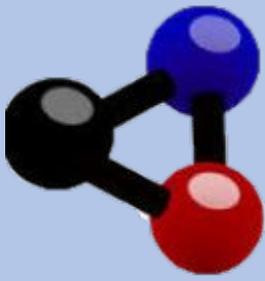
95.96 u

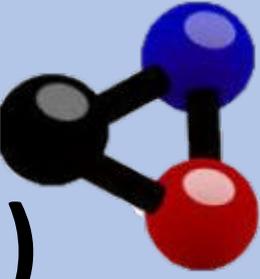
View Legend

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

आवर्त सारणी की योजना

SCHEME of PERIODIC TABLE





दीर्घ रूप आवर्त सारणी (मोनोक्रोम)

Long Form of Periodic Table (Monochrome)

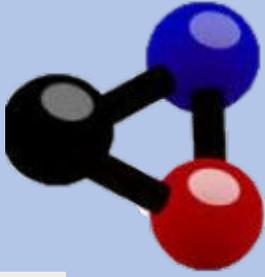
- Monochrome
- Blocks
- Iconic
- Family
- Groups
- Colors

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

82 u

आवर्त सारणी के ब्लॉक्स

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

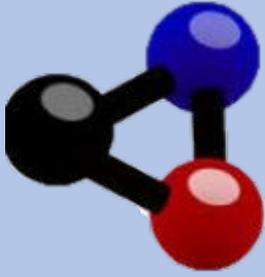
- s-Block
- p-Block
- d-Block
- f-Block

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
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		

प्रत्येक तत्व एक प्रतीक द्वारा दर्शाया जाता है जो इसके उपयोग का प्रतिनिधित्व करता है



ICONIC VIEW

File View Tools Settings Help

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

Information Overview

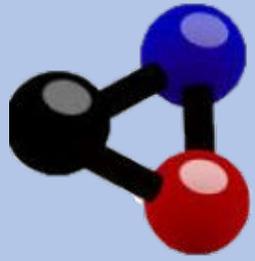
- Monochrome
- Blocks
- Iconic
- Family
- Groups
- Colors

Mo

View

आवर्त सारणी में परिवार/वर्ग

Family in Periodic Table



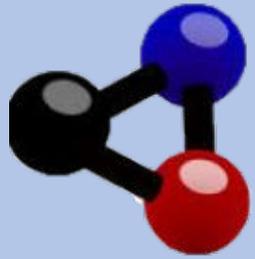
078 u

- 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
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	

आवर्त सारणी में वर्ग

Groups in Periodic table



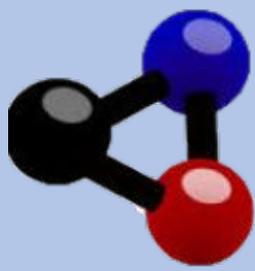
Monochrome
Blocks
Iconic
Family
• Groups
Colors

941 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	

कैल्शियम - ग्रेडिएंट्स

Kalzium - Gradients

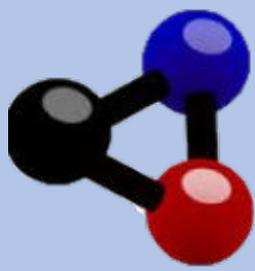


Gradients ▾ Isotope Table... M

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

द्रव्य की अवस्थाएं

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

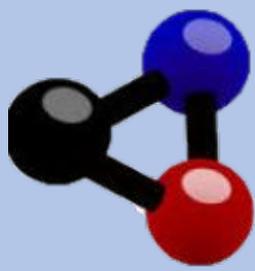
state of matter

Solid	Vaporous
Liquid	Unknown

Scheme: Colors

Nice colors without meaning. (Fr

परमाणु द्रव्यमान Atomic Mass



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

Information
Overview

Neptunium

${}_{93}\text{Np}$

237 u

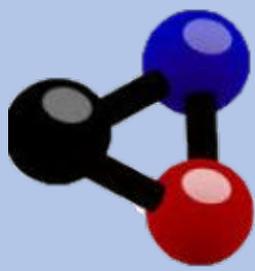
Legend
Atomic Mass (logarithmic)
Minimum: 1.00794 u
Maximum: 294 u

Scheme: Blocks
s-Block
p-Block
d-Block
f-Block

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

3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18				
															He 4.0026				
										B 10.811	C 12.0107	N 14.0067	O 15.9994	F 18.9984	Ne 20.1797				
										Al 26.9815	Si 28.0855	P 30.9738	S 32.065	Cl 35.453	Ar 39.948				
		Sc 44.9559	Ti 47.867	V 50.9415	Cr 51.9961	Mn 54.938	Fe 55.845	Co 58.9332	Ni 58.6934	Cu 63.546	Zn 65.38	Ga 69.723	Ge 72.64	As 74.9216	Se 78.96	Br 79.904	Kr 83.798		
		Rb 85.4678	Sr 87.62	Y 88.9059	Zr 91.224	Nb 92.9064	Mo 95.96	Tc 98	Ru 101.07	Rh 102.906	Pd 106.42	Ag 107.868	Cd 112.411	In 114.818	Sn 118.71	Sb 121.76	Te 127.6	I 126.904	Xe 131.293
		Cs 132.905	Ba 137.327	La 138.905	Hf 178.49	Ta 180.948	W 183.84	Re 186.207	Os 190.23	Ir 192.217	Pt 195.084	Au 196.967	Hg 200.59	Tl 204.383	Pb 207.2	Bi 208.98	Po 209	At 210	Rn 222
		Fr 223	Ra 226	Ac 227	Rf 265	Db 268	Sg 271	Bh 272	Hs 270	Mt 276	Ds 281	Rg 280	Cn 285	Nh 284	Fl 289	Mc 288	Lv 293	Ts n/a	Og 294
					Ce 140.116	Pr 140.908	Nd 144.242	Pm 145	Sm 150.36	Eu 151.964	Gd 157.25	Tb 158.925	Dy 162.5	Ho 164.93	Er 167.259	Tm 168.934	Yb 173.054	Lu 174.967	
					Th 232.038	Pa 231.036	U 238.029	Np 237	Pu 244	Am 243	Cm 247	Bk 247	Cf 251	Es 252	Fm 257	Md 258	No 259	Lr 262	

इलेक्ट्रॉन ऋणात्मकता (पॉलिंग स्केल) Electronegativity (Pauling scale)

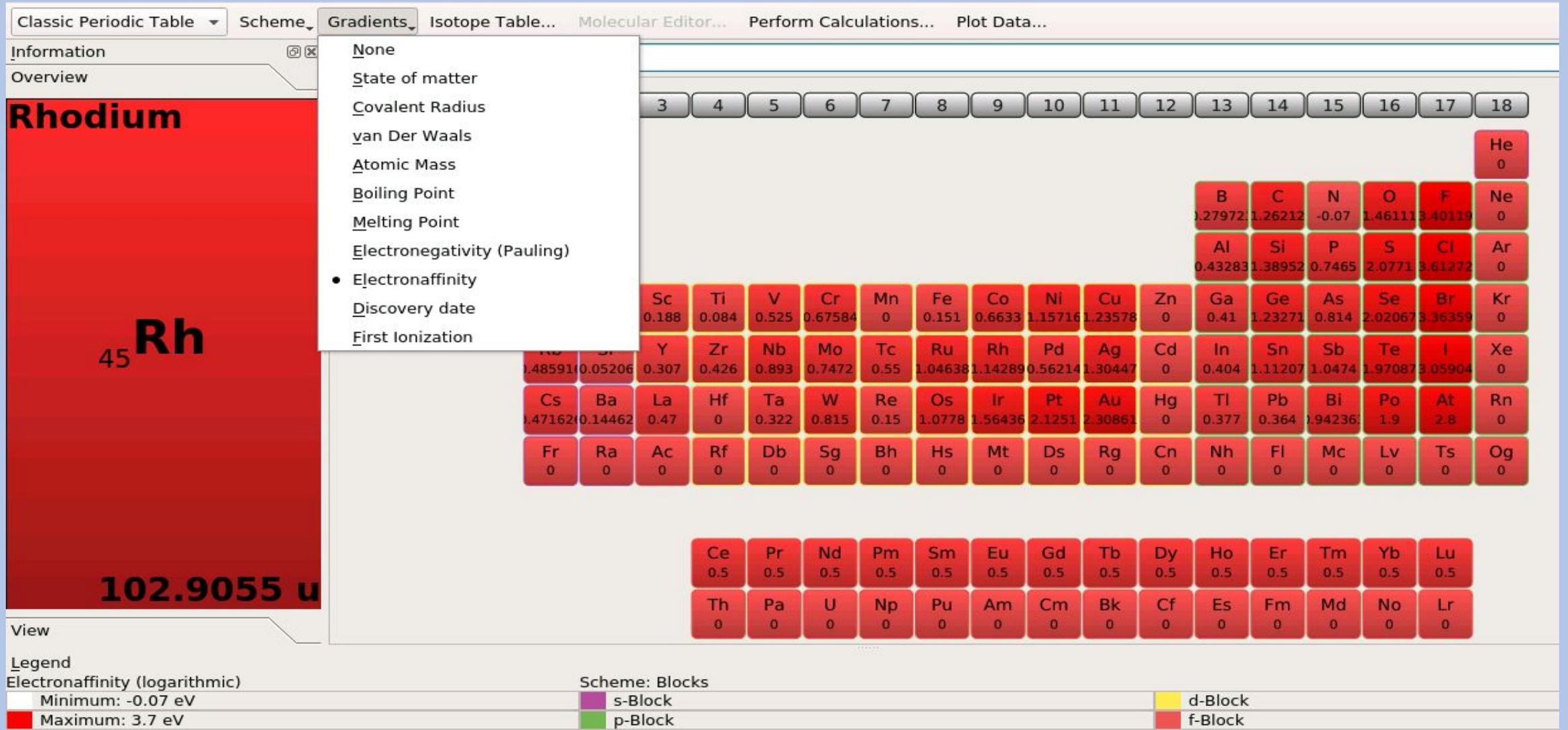
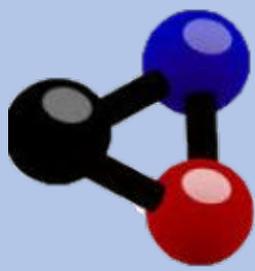


Gradients_ Isotope Table... Molecular Editor... Perform Calculations... Plot Data...

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

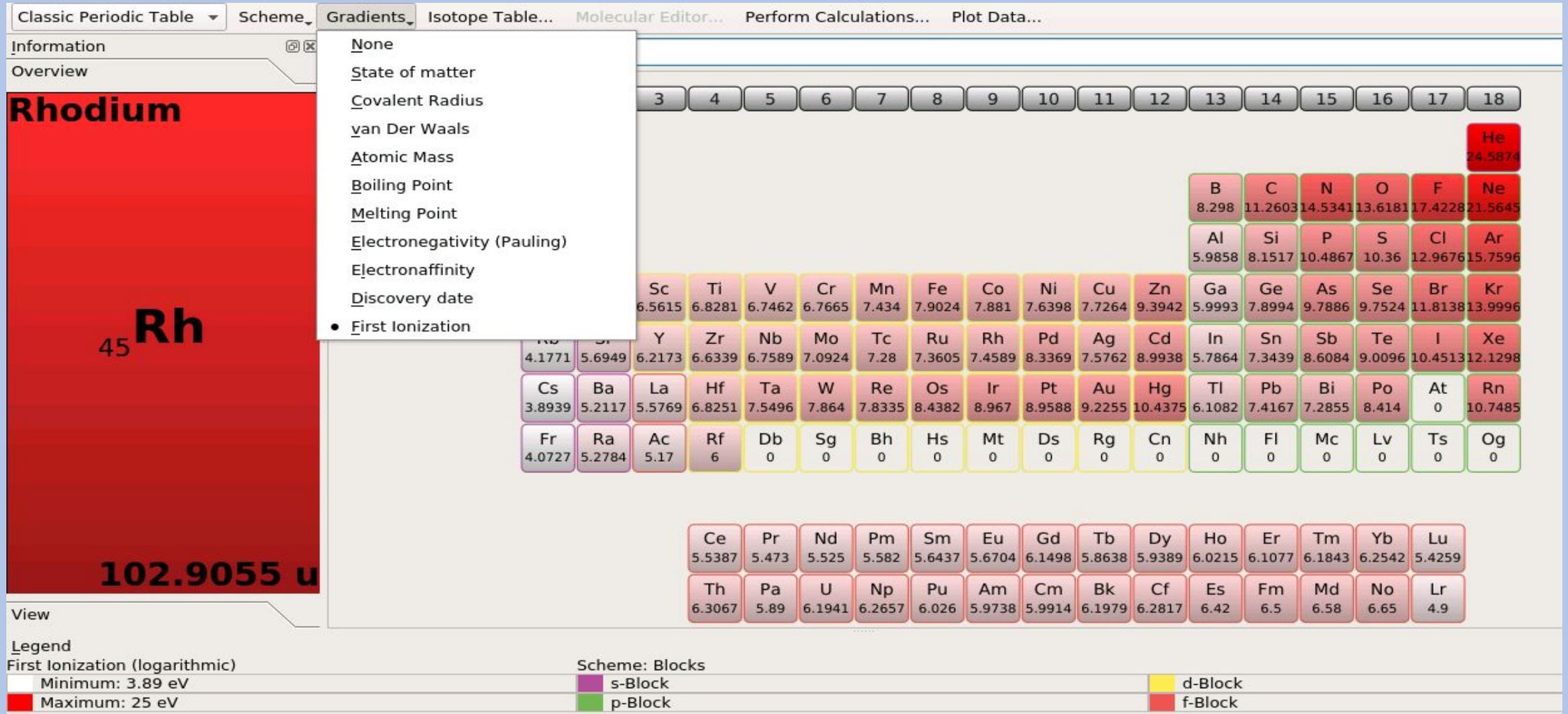
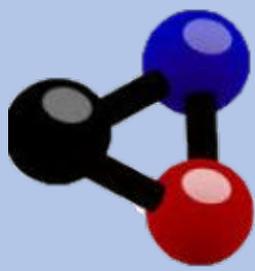
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
																	He n/a	
												B 2.04	C 2.55	N 3.04	O 3.44	F 3.98	Ne n/a	
												Al 1.61	Si 1.9	P 2.19	S 2.58	Cl 3.16	Ar n/a	
		Sc 1.36	Ti 1.54	V 1.63	Cr 1.66	Mn 1.55	Fe 1.83	Co 1.88	Ni 1.91	Cu 1.9	Zn 1.65	Ga 1.81	Ge 2.01	As 2.18	Se 2.55	Br 2.96	Kr 3	
		Y 1.22	Zr 1.33	Nb 1.6	Mo 2.16	Tc 1.9	Ru 2.2	Rh 2.28	Pd 2.2	Ag 1.93	Cd 1.69	In 1.78	Sn 1.96	Sb 2.05	Te 2.1	I 2.66	Xe 2.6	
	Rb 0.82	Sr 0.95	La 1.1	Hf 1.3	Ta 1.5	W 2.36	Re 1.9	Os 2.2	Ir 2.2	Pt 2.28	Au 2.54	Hg 2	Tl 1.62	Pb 2.33	Bi 2.02	Po 2	At 2.2	Rn n/a
	Fr 0.7	Ra 0.9	Ac 1.1	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
			Ce 1.12	Pr 1.13	Nd 1.14	Pm n/a	Sm 1.17	Eu n/a	Gd 1.2	Tb n/a	Dy 1.22	Ho 1.23	Er 1.24	Tm 1.25	Yb n/a	Lu 1.27		
			Th 1.3	Pa 1.5	U 1.38	Np 1.36	Pu 1.28	Am 1.3	Cm 1.3	Bk 1.3	Cf 1.3	Es 1.3	Fm 1.3	Md 1.3	No 1.3	Lr n/a		

इलेक्ट्रॉन बन्धुता Electron Affinity



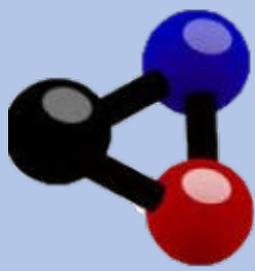
पहली आयनन ऊर्जा (eV)

First Ionization Energy (eV)



तत्व पर डबल क्लिक करें

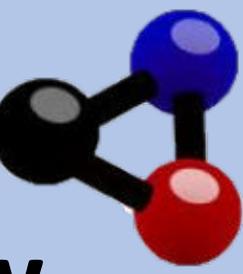
Double Click on an element



H 20.28																	He 4.216														
Li 1615	Be 3243											B 4275	C 5100	N 77.344	O 90.188	F 85	Ne 27.1														
Na 1156	Mg 1380											Al 2740	Si 2630	P 553	S 717.82	Cl 239.18	Ar 87.45														
K 1033	Ca 1757	Sc 3109	Ti 3560	V 3650	Cr 2945	Mn 2235	Fe 3023	Co 1143	Ni 3005	Cu 2840	Zn 1180	Ga 2478	Ge 3107	As 876	Se 958	Br 331.85	Kr 120.85														
Rb 961	Sr 1655	Y 3611	Zr 4682	Nb 5015	Mo 4912	Tc 4538	Ru 4425	Rh 3970	Pd 3240	Ag 2436	Cd 1040	In 2350	Sn 2876	Sb 1860	Te 1261	I 457.5	Xe 165.1														
Cs 944	Ba 2078	La 3737	Hf 4875	Ta 5730	W 5825	Re 5870	Os 5300	Ir 4700	Pt 4100	Au 3130	Hg 629.88	Tl 1746	Pb 2023	Bi 1837	Po n/a	At 610	Rn 211.4														
Fr 950	Ra 1413	Ac 3470	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														
																		Ce 3715	Pr 3785	Nd 3347	Pm 3273	Sm 2067	Eu 1800	Gd 3545	Tb 3500	Dy 2840	Ho 2968	Er 3140	Tm 2223	Yb 1469	Lu 3668
																		Th 5060	Pa 4300	U 4407	Np 4175	Pu 3505	Am 2880	Cm 3383	Bk 983	Cf 1743	Es n/a	Fm n/a	Md n/a	No n/a	Lr n/a

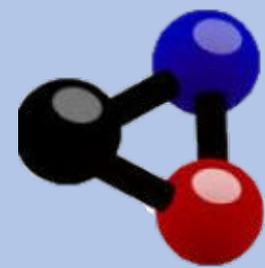
तत्व पर डबल क्लिक करें - डेटा अवलोकन

Double Click on an Element – Data Overview



- गलनांक (melting point)
- क्वथनांक (boiling point)
- इलेक्ट्रॉन बन्धुता (electron affinity)
- इलेक्ट्रॉनिक विन्यास (electronic configuration)
- सहसंयोजक त्रिज्या (covalent radius)
- वॉनडरवाल रेडियस (van der Waal radius)
- परमाण्वीय त्रिज्या (atomic radius)
- पहली आयनन ऊर्जा (First Ionization Energy)
- इलेक्ट्रॉन ऋणात्मकता (Electronegativity)
- ऑक्सीकरण अवस्था (oxidation state)

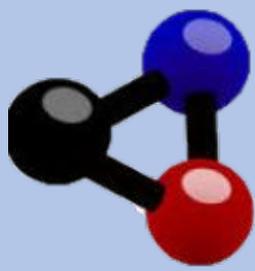
लोहा (Fe) पर डबल क्लिक करें Double-click on Iron(Fe)



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

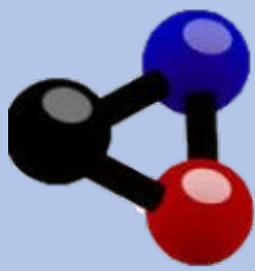
क्रोमियम(Cr) पर डबल क्लिक करें

Double-click on Chromium(Cr)



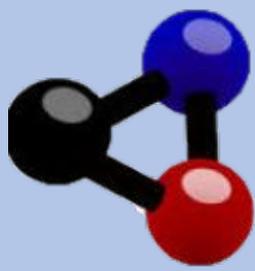
Data Overview	Data Overview		
Atom Model	Cr	Chromium	Block: d
Isotopes		Melting Point	2130 K
Miscellaneous		Boiling Point	2945 K
Spectrum		Electron Affinity	0.6758 eV
Extra information		Electronic configuration	[Ar] 3d ⁵ 4s ¹
		Covalent Radius	127 pm
		van der Waals Radius	205 pm
		Atomic mass	51.9961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

परमाणु मॉडल Atomic Model



Data Overview	Atom Model
Atom Model	[Ar] 3d ⁵ 4s ¹
Isotopes	
Miscellaneous	
Spectrum	
Extra information	

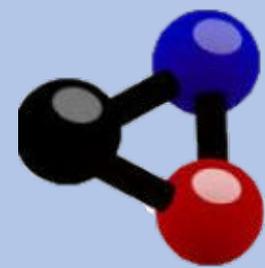
क्रोमियम(Cr) के आइसोटोप Isotopes of Chromium(Cr)



Data Overview	Isotopes						
Atom Model	Cr Chromium						Block: d
Isotopes	Isotope-Table						
Miscellaneous	Mass	Neutrons	Percentage	Half-life period	Energy and Mode of Decay	Spin and Parity	Magnetic Moment
Spectrum	42.0064 u	18					
Extra information	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 u							

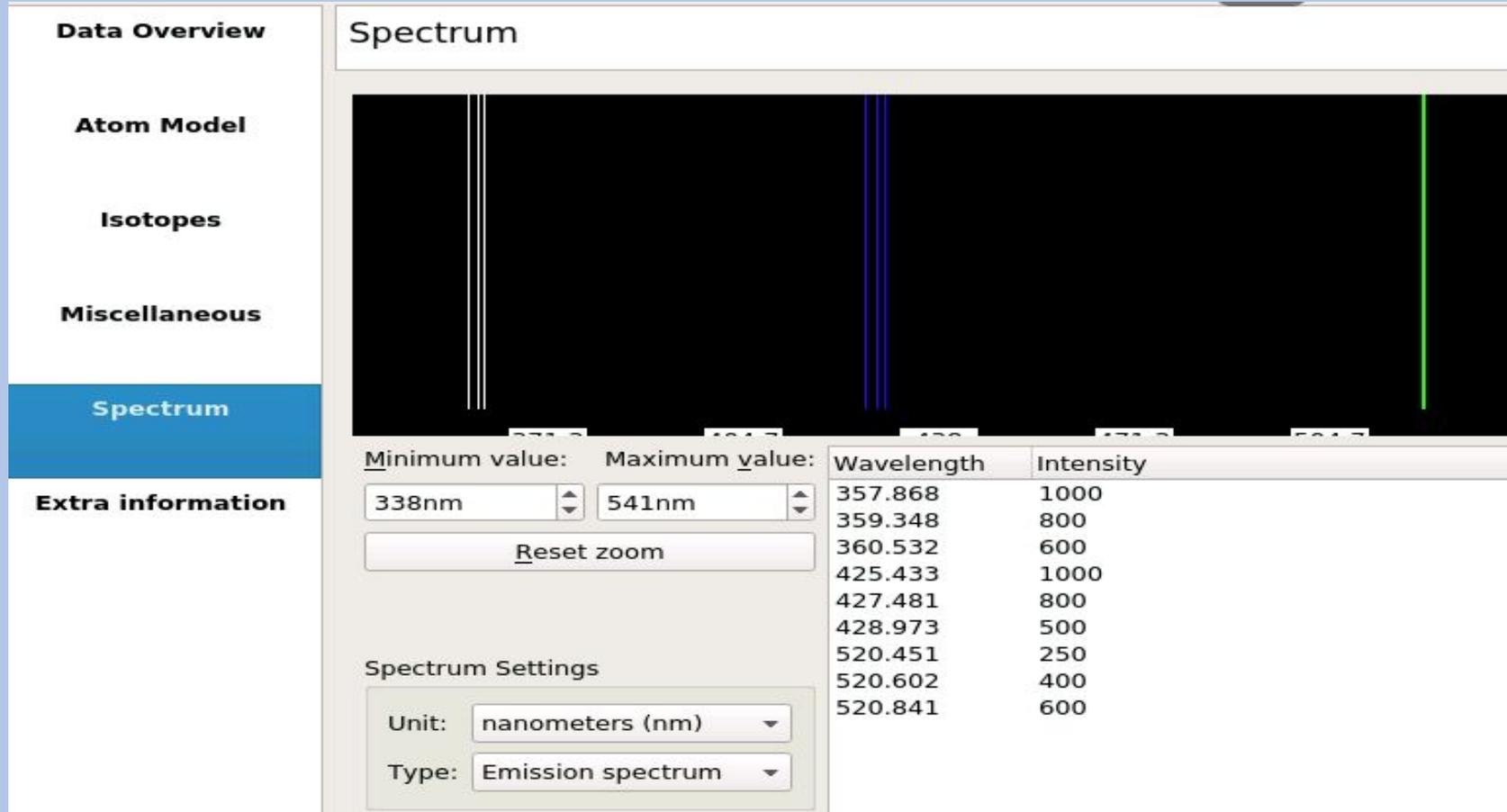
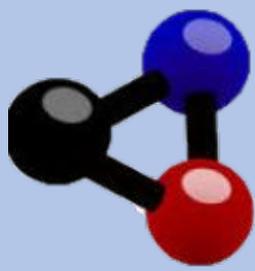
विविध जानकारी

Miscellaneous Information

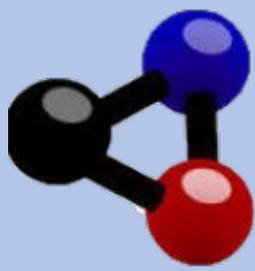


Data Overview	Miscellaneous
Atom Model	
Isotopes	
Miscellaneous	<p>Cr <u>Chromium</u> Block: d</p> <p> This element was discovered in the year 1797. It was discovered by Nicholas Louis Vauquelin.</p> <p> Origin of the name: Greek 'chroma' means 'color'</p>

क्रोमियम (Cr) का स्पेक्ट्रम Spectrum of Chromium (Cr)



न्यूमरेशन Numeration



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

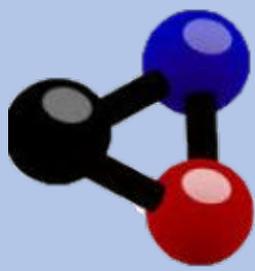
H 20.28																He 4.216	
Li 6.941	Be 9.012										B 10.81	C 12.011	N 14.007	O 15.999	F 18.998	Ne 20.180	
Na 22.990	Mg 24.305										Al 26.982	Si 28.086	P 30.974	S 32.06	Cl 35.45	Ar 39.948	
K 39.098	Ca 40.078	Sc 44.956	Ti 47.88	V 50.942	Cr 52.004	Mn 54.938	Fe 55.845	Co 58.933	Ni 58.71	Cu 63.546	Zn 65.38	Ga 69.723	Ge 72.63	As 74.922	Se 78.96	Br 79.904	Kr 83.80
Rb 85.468	Sr 87.62	Y 88.906	Zr 91.224	Nb 92.906	Mo 95.94	Tc 98.906	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 127.6	I 126.90	Xe 131.29
Cs 132.91	Ba 137.33	La 138.905	Hf 178.49	Ta 180.948	W 183.85	Re 186.207	Os 190.23	Ir 192.22	Pt 195.084	Au 196.967	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
			Ce 140.12	Pr 140.91	Nd 140.91	Pm 144.91	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	

116 Lv

293 u

मेनू बार - गणना करें

Menu Bar - Perform Calculations



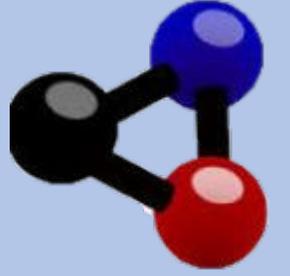
Perform Calculations... Plot Data...

5 6 7 8 9 10 11 12 1

	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	G
50	3650	2945	2235	3023	3143	3005	2840	1180	24
r	Nb	Mo	Tc	Ru	Rh	Pd	Aq	Cd	ll

कैलज़ियम कैलकुलेटर

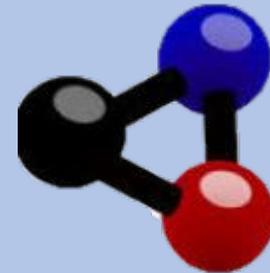
The Kalzium Calculator



- आणविक द्रव्यमान कैलकुलेटर (molecular mass calculator)
- एकाग्रता कैलकुलेटर (concentration calculator)
- परमाणु कैलकुलेटर (nuclear calculator)
- गैस कैलकुलेटर (gas calculator)
- अनुमापन कैलकुलेटर (titration calculator)
- समीकरण बैलेंसर (equation balancer)

कैल्ज़ियम कैल्कुलेटर

The Kalzium Calculator



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**

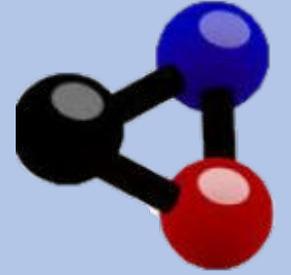
This calculator can balance chemical equations.

- **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.

आणविक द्रव्यमान कैलकुलेटर Molecular Mass Calculator



H2SO4

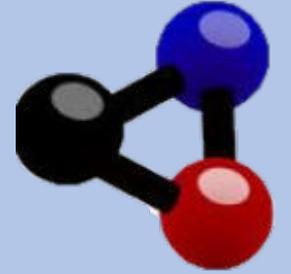
H₂ S₁ O₄

Molecular mass: 98.0785 u

Details

Composition						Aliases used
	Element	Atoms	Atomic mass	Total mass	Percentage	aliases
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	

अनुमापन कैलकुलेटर Concentration Calculator



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

परमाणु कैलकुलेटर Nuclear Calculator

Element Name:	Uranium	
Isotope mass:	239.054	
Half-life:	1407.0000	year (y)
Atomic mass:	239.054	grams / mole

Other data

Calculate:	Time	
Initial amount:	6.0000	grams (g)
Final amount:	3.0000	grams (g)
Time:	1407.0000	year (y)

गैस कैलकुलेटर

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)



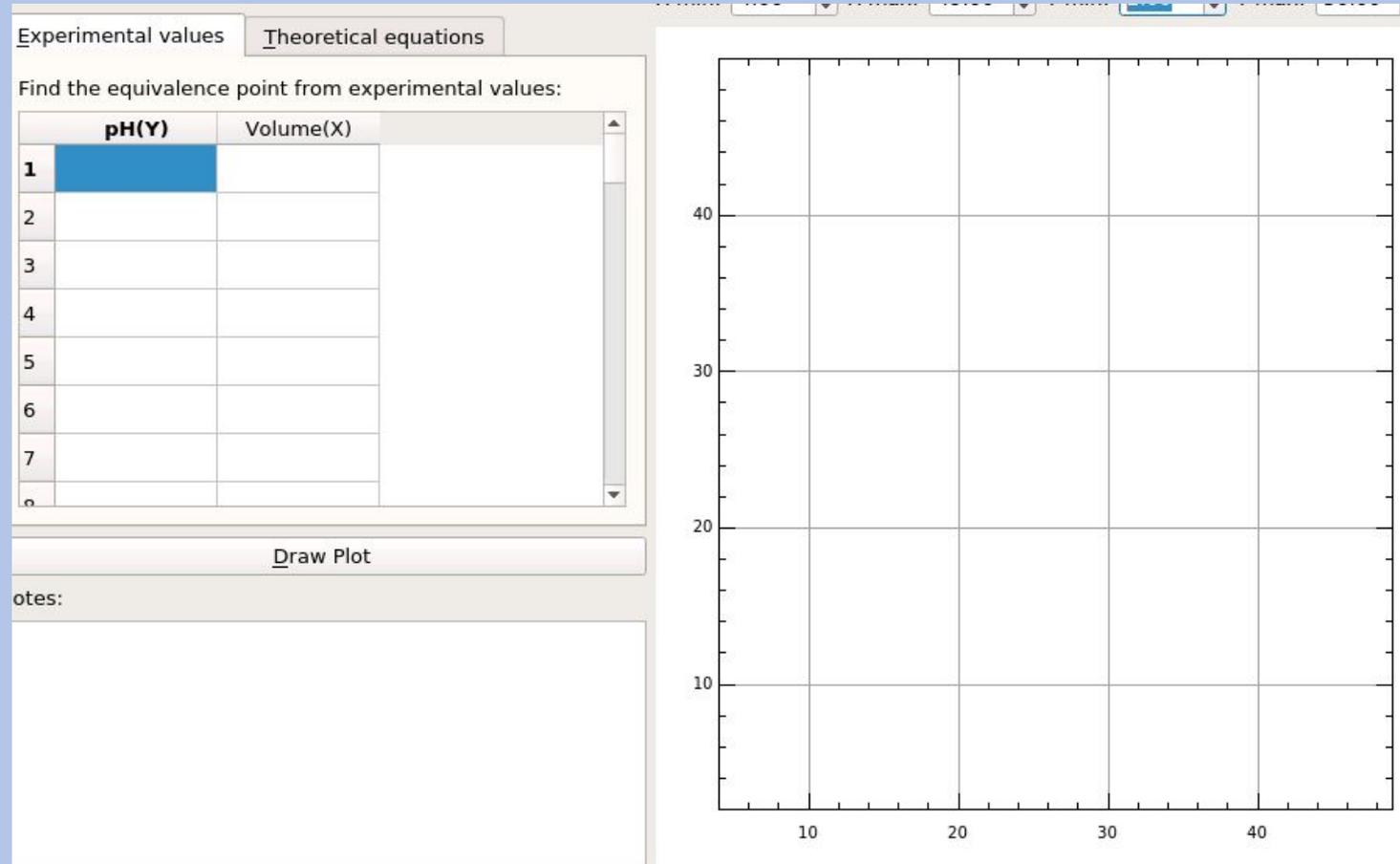
Volume:

22.4024

liters (l)



अनुमापन कैलकुलेटर Titration Calculator



समीकरण बैलेंसर Equation Balancer

Equation:

aCH₃(CH₂)₃COOH + bO₂ -> cH₂O + dCO₂

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** H₂O)

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

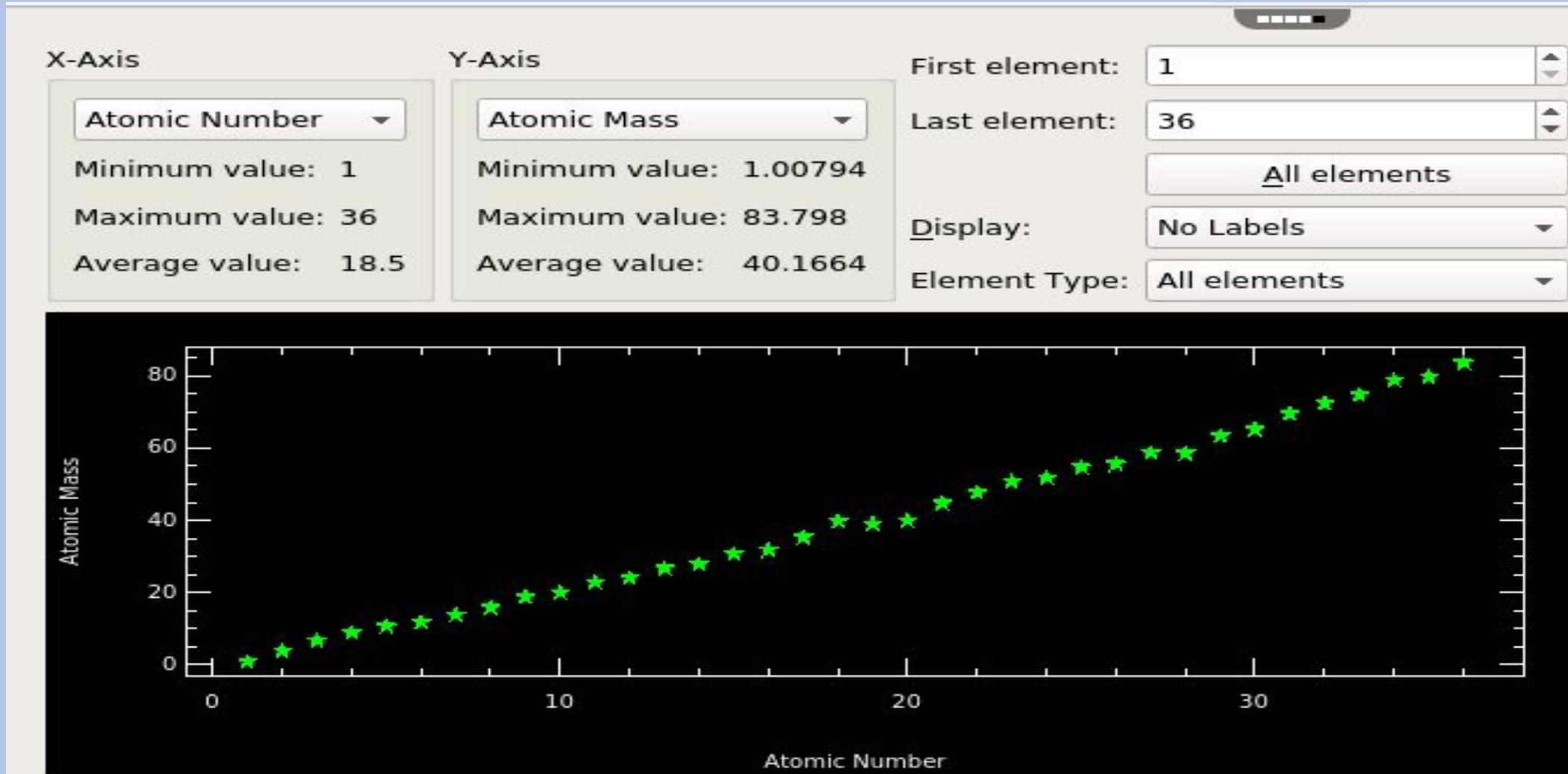
Defining electric charges

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⁺ + **2** O -> **2** H₂O²⁺)

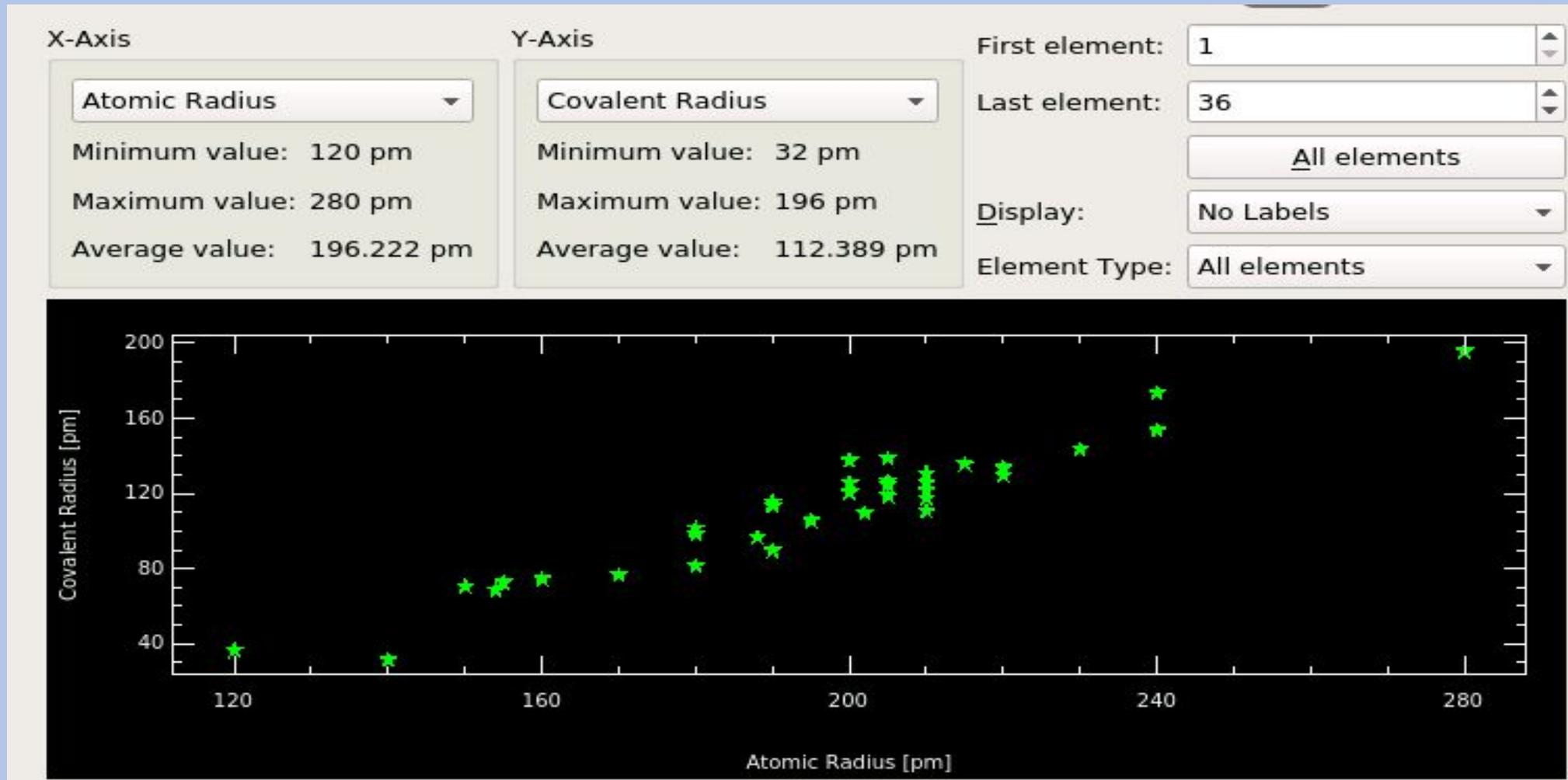
रेखा-चित्र - परमाणु क्रमांक बनाम परमाणु द्रव्यमान

Plot Data – Atomic Number vs Atomic Mass

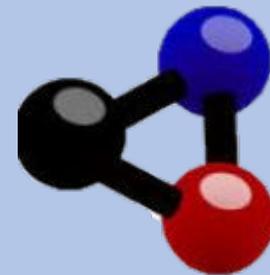


प्लॉट डेटा – परमाणु त्रिज्या बनाम सहसंयोजक त्रिज्या

Plot Data – Atomic Radius vs Covalent Radius



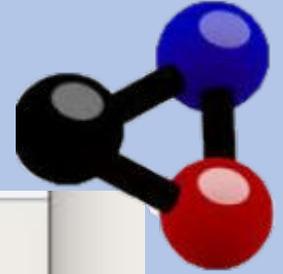
संख्यात्मक उपसर्ग Numeric Prefixes



Greek alphabet	Numeric Prefixes and Roman Numerals		
	Number	Prefix	Roman Numerals
Numbers	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	

जोखिम और सुरक्षा वाक्यांश

Risk & Safety Phrases



9 - Explosive when mixed with combustible 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

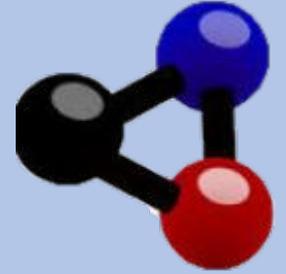
S-Phrases: 1-2-3-4-5-6-7-8-9

Filter

Close

Help

जोखिम और सुरक्षा वाक्यांश 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:

S-Phrases:

संदर्भ

References

- 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://kde.org/applications/en/education/org.kde.kalzium>
- 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>