

	meters	dm	cm	mm	µm	nm	Å
1Å =	10 ⁻¹⁰	10 ⁻⁹	10 ⁻⁸	10 ⁻⁷	10 ⁻⁴	10 ⁻¹	1
1nm =	10 ⁻⁹	10 ⁻⁸	10 ⁻⁷	10 ⁻⁶	10 ⁻³	1	10
1µm =	10 ⁻⁶	10 ⁻⁵	10 ⁻⁴	10 ⁻³	1	10 ³	10 ⁴
1mm =	10 ⁻³	10 ⁻²	10 ⁻¹	1	10 ³	10 ⁶	10 ⁷
1cm =	10 ⁻²	10 ⁻¹	1	10	10 ⁴	10 ⁷	10 ⁸
1dm =	10 ⁻¹	1	10	10 ²	10 ⁵	10 ⁸	10 ⁹
1m =	1	10	10 ²	10 ³	10 ⁶	10 ⁹	10 ¹⁰

Crystal Structures		
 Cubic, face centered	 Cubic, body centered	
 Cubic	 Hexagonal	 Monoclinic
 Orthorhombic	 Tetragonal	 Rhombohedral

IA

1

1.008

H

Hydrogen



IIB

3

6.941

Li

Lithium



11

22.990

Na

Sodium



37

85.468

Rb

Rubidium



55

132.905

Cs

Cesium



87

(223)

Fr

Francium



IIA

4

9.012

Be

Beryllium



12

24.305

Mg

Magnesium



20

40.08

Ca

Calcium



38

87.62

Sr

Strontium



56

137.33

Ba

Barium



88

226.025

Ra

Radium



IIIB

21

44.956

Sc

Scandium



39

88.906

Y

Yttrium



57

138.906

La

Lanthanum



89

227.028

Ac

Actinium



IVB

22

47.88

Ti

Titanium



40

91.22

Zr

Zirconium



72

178.49

Hf

Hafnium



VB

23

50.942

V

Vanadium



41

92.906

Nb

Niobium



73

180.948

Ta

Tantalum



VIB

24

51.996

Cr

Chromium



42

95.94

Mo

Molybdenum



74

183.85

W

Tungsten



VIIB

25

54.938

Mn

Manganese



43

(98)

Tc

Technetium



75

186.207

Re

Rhenium



VIII

26

55.847

Fe

Iron



27

58.933

Co

Cobalt



28

58.70

Ni

Nickel



29

63.546

Cu

Copper



30

65.39

Zn

Zinc



44

101.07

Ru

Ruthenium



45

102.906

Rh

Rhodium



46

106.42

Pd

Palladium



47

107.868

Ag

Silver



48

112.41

Cd

Cadmium



76

190.2

Os

Osmium



77

192.22

Ir

Iridium



78

195.08

Pt

Platinum



79

196.967

Au

Gold



80

200.59

Hg

Mercury



IB

29

63.546

Cu

Copper



47

107.868

Ag

Silver



79

196.967

Au

Gold



IIB

30

65.39

Zn

Zinc



48

112.41

Cd

Cadmium



80

200.59

Hg

Mercury



IIIA

5

10.811

B

Boron



13

26.982

Al

Aluminum



31

69.72

Ga

Gallium



49

114.82

In

Indium



81

204.38

Tl

Thallium



IVA

6

12.011

C

Carbon



14

28.086

Si

Silicon



32

72.61

Ge

Germanium



50

118.71

Sn

Tin



82

207.2

Pb

Lead



VA

7

14.007

N

Nitrogen



15

30.974

P

Phosphorus



33

74.922

As

Arsenic



51

121.76

Sb

Antimony



83

208.980

Bi

Bismuth



VIA

8

15.999

O

Oxygen



16

32.066

S

Sulfur



34

78.96

Se

Selenium



52

127.60

Te

Tellurium



84

(209)

Po

Polonium



VIIA

9

18.998

F

Fluorine



17

35.453

Cl

Chlorine



35

79.904

Br

Bromine



53

126.905

I

Iodine



85

(210)

At

Astatine



VIIIA

2

4.003

He

Helium



10

20.180

Ne

Neon



18

39.948

Ar

Argon



36

83.80

Kr

Krypton



54

131.29

Xe

Xenon



86

(222)

Rn

Radon



MATERIALS ANALYSIS DIVISION

meters

dm

cm

mm

µm

nm

Å

1Å =

10⁻¹⁰

10⁻⁹

10⁻⁸

10⁻⁷

10⁻⁴

10⁻¹

1

1nm =

10⁻⁹

10⁻⁸

10⁻⁷

10⁻⁶

10⁻³

1

10

1µm =

10⁻⁶

10⁻⁵

10⁻⁴

10⁻³

1

10³

10⁴

1mm =

10⁻³

10⁻²

10⁻¹

1

10³

10⁶

10⁷

1cm =

10⁻²

10⁻¹

1

10

10⁴

10⁷

10⁸

1dm =

10⁻¹

1

10

10²

10⁵

10⁸

10⁹

1m =

1

10

10²

10³

10⁶

10⁹

10¹⁰

Crystal Structures



Cubic, face centered



Cubic, body centered



Cubic



Hexagonal



Monoclinic



Orthorhombic



Tetragonal



Rhombohedral

58

140.12

Gd

Gadolinium



59

140.908

Er

Erbium



60

144.24

Nd

Niodymium



61

(145)

Pm

Promethium



62

150.36

Sm

Samarium



63

151.97

Eu

Europium



64

157.25

Gd

Gadolinium



65

158.925

Th

Thulium



66

162.50

Dy

Dysprosium



67

164.930

Ho

Holmium



68

167.26

Er

Erbium



69

168.934

Tm

Thulium



70

173.04

Yb

Ytterbium



71

174.967

Lu

Lutetium

Atomic Number	Atomic Weight
Symbol	
K α Energy (*)	
L α Energy (*)	
M Energy (*)	
Crystal Structure	

Alkali Metals	Alkaline Earth
Rare Earth	Other Metals
Non-Metals	Halogens
Transition Metals	Metalloids
Noble Gases	Actinides

58	140.12	59	140.908	60	144.24	61	(145)	62	150.36	63	151.97	64	157.25	65	158.925	66	162.50	67	164.930	68	167.26	69	168.934	70	173.04	71	174.967
Ce	Cerium	Pr	Praseodymium	Nd	Neodymium	Pm	Promethium	Sm	Samarium	Eu	Europium	Gd	Gadolinium	Tb	Terbium	Dy	Dysprosium	Ho	Holmium	Er	Erbium	Tm	Thulium	Yb	Ytterbium	Lu	Lutetium
90	232.038	91	231.036	92	238.029	93	237.048	94	(244)	95	(243)	96	(247)	97	(247)	98	(251)	99	(252)	100	(257)	101	(258)	102	(259)	103	(260)
Th	Thorium	Pa	Protoactinium	U	Uranium	Np	Neptunium	Pu	Plutonium	Am	Americium	Cm	Curium	Bk	Berkelium	Cf	Californium	Es	Einsteinium	Fm	Fermium	Md	Mendelevium	No	Nobelium	Lr	Lawrencium