

# The Periodic Table of Meat

1 B

Bacon

2 H

Hamburger

3 P

Pork chops

4 Bb

Baby back ribs

11 Pl

Pork loin

12 Sr

Spare ribs

19 Cu

Pork cutlet

20 Hh

Hamhock

21 Ha

Sliced ham

22 Ca

Capicola

23 Cd

Corned beef

24 Tp

Beef tri-tip

25 Bs

Beef sausage

26 R

Beef ribs

27 Kb

Kobe

28 Rt

Pot roast

29 Cr

Crab

30 Tu

Tuna

31 Lb

Lobster

32 Pg

Chicken parmigiana

33 Tm

Chicken tempura

34 Fg

Chicken fingers

35 Ng

Chicken nuggets

36 Fr

Fried chicken

37 Ro

Pork roast

38 Cz

Chorizo

39 Ch

Christmas ham

40 Mr

Mortadella

41 Rb

Roast beef

42 He

Head cheese

43 Td

Beef tenderloin

44 S

T-bone steak

45 Fm

Filet Mignon

46 Sf

Stroganoff

47 St

Beef stew

48 Cb

Chicken cordon bleu

49 C

Grilled chicken

50 Gt

General Tso's chicken

51 Ty

Teriyaki chicken

52 Jm

Jamaican jerk

53 W

Buffalo wings

54 Q

BBQ chicken

55 Pp

Pulled pork

56 Ap

Al pastor

57 Z

Zungenwurst

58 Rs

Prosciutto

59 Pm

Pastrami

60 Cw

Cow tongue

61 Pr

Pepper steak

62 Tt

Steak Tartare

63 Si

Strip steak

64 Md

Mandarin beef

65 Bt

Brisket

66 Cs

Chicken casserole

67 Re

Rotisserie chicken

68 Tr

Tandoori

69 K

Kabobs

70 Gb

Gumbo

71 Sp

Spam

72 Pe

Pepperoni

73 Gr

Ground pork

74 Ct

Carnitas

75 Fe

Pig's feet

76 Pt

Pancetta

77 Gy

Gyro

78 Fi

Steak fingers

79 Sy

Salisbury steak

80 Cf

Chicken fried steak

81 Ry

Ribeye

82 Sw

Shawarma

83 J

Beef jerky

84 D

Duck

85 Th

Thanksgiving turkey

86 T

Sliced turkey

87 Sm

Summer sausage

88 Bg

Bologna

89 Lf

Pimento loaf

90 Hd

Hot dogs

Red Meat

Seafood

The Noble Meats

Cold Cuts

Steaks

Gamey

Poultry

Mixed

**Key Meat Facts:**

- Bacon is the "meat of life." Without bacon, life on earth as we know it could not exist
- Noble Meats are named as such because they rate the highest on the Glanburg "Yumminess Scale." Lowest-ranking meats include Pig's feet, Spam and Roadkill
- Meats occur in two basic forms: boned and boneless
- Basic chemical formulas: H<sub>2</sub>B = Bacon Double Cheeseburger; ThReD = Turducken; HaRbT = Cold Cut Trio; HdQH = A Barbeque; FrCiB = Heart attack

91 Bn

Bison

92 Ek

Elk

93 L

Lamb

94 Go

Goat

95 Kl

Roadkill

96 Bh

Bushmeat

97 Dr

Deer

98 Ra

Rabbit

99 Wb

Wild boar

100 O

Ostrich

101 E

Emu

102 G

Gator

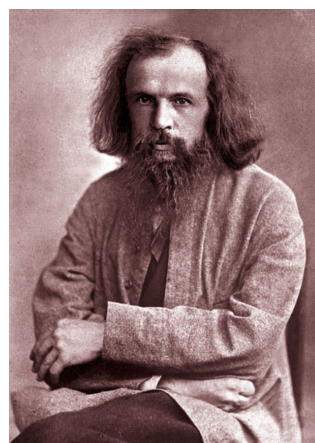
## 1.2 The Periodic Table

### The Periodic Table

The periodic table is an incredibly helpful tool in Chemistry as it organizes all of the elements on earth (natural and synthetic) into groups/families that share characteristics. This allows scientists to observe a great number of things from only a quick glance at the table including, but not limited to,

- atomic number
- atomic mass
- valence electrons (chemical reactivity)
  - \*relates to the **shell model**
- various physical properties including standard state

Dmitri Mendeleev is the scientist credited with the original periodic table (1869) and the discovery of the periodic law.



<http://www.biography.com/people/dmitri-mendeleev-9415468#youth-and-education>

### Periodic Trends

Periodic trends are specific patterns that are present in the periodic table that illustrate characteristics of a certain element. Major periodic trends include:

- electronegativity
- ionization energy
- atomic radius
- melting point
- metallic character

## 1.2 The Periodic Table

### Electronegativity

Electronegativity is a chemical property describing an atom's ability to attract and bind with electrons (the measure of an atom's tendency to attract and form bonds with electrons).

-This property exists due to the octet rule (referring to the number of electrons in an atom's valence shell)

-The Pauling scale (named after Linus Pauling) shows us unit-less values that quantify the electronegativity of each atom

-Trends:

1. From left to right across a period of elements, electronegativity increases.

- If the valence shell of an atom is less than half full, it requires less energy to lose an electron than to gain one. Conversely, if the valence shell is more than half full, it is easier to pull an electron into the valence shell than to donate one.

2. From top to bottom down a group, electronegativity decreases.

- This is because atomic number increases down a group, and thus there is an increased distance between the valence electrons and nucleus, or a greater atomic radius.

\*Important exceptions of the above rules include the noble gases, lanthanides, and actinides. The noble gases possess a complete valence shell and do not usually attract electrons. The lanthanides and actinides possess more complicated chemistry that does not generally follow any trends. Therefore, noble gases, lanthanides, and actinides do not have electronegativity values.

\*\*As for the transition metals, although they have electronegativity values, there is little variance among them across the period and up and down a group. This is because their metallic properties affect their ability to attract electrons as easily as the other elements.

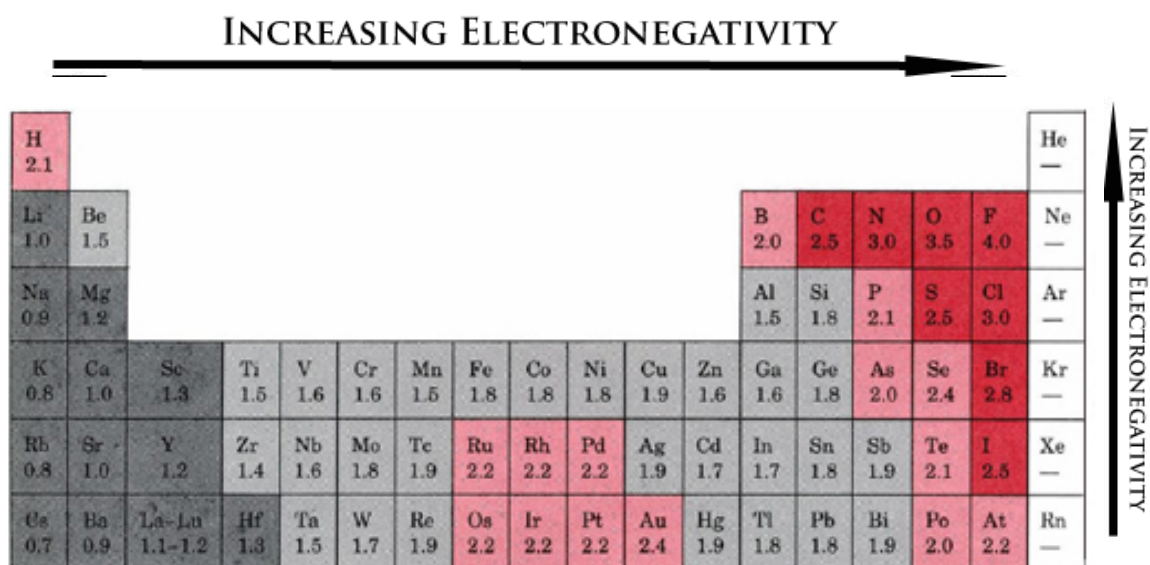


Figure 1. Periodic Table of Electronegativity values

1.2 The Periodic Table

Ionization Energy Trend

Ionization energy is the energy required to remove an electron from a neutral atom in it's gaseous phase (essentially, it is the opposite of electronegativity). The lower the energy is, the easier the atom becomes a cation

- Trends:
- 1. The ionization energy of the elements within a period generally increases from left to right. This is due to valence shell stability.
  - 2. The ionization energy of the elements within a group generally decreases from top to bottom. This is due to electron shielding.
  - 3. The noble gases possess very high ionization energies because of their full valence shells as indicated in the graph. Note that helium has the highest ionization energy of all the elements.

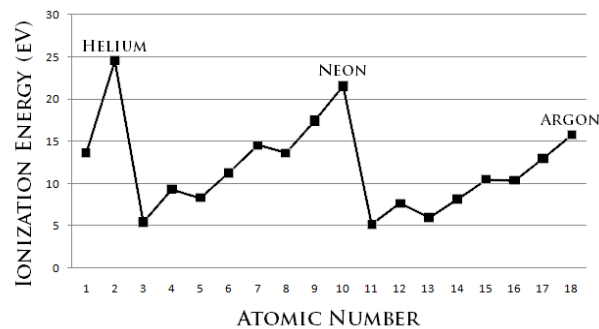


Figure 3. Graph showing the Ionization Energy of the Elements from Hydrogen to Argon

| INCREASING IONIZATION ENERGY |           |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          |         | INCREASING IONIZATION ENERGY |           |            |               |            |            |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
|------------------------------|-----------|-----------|----------|----------|----------|-----------|--------|-----------|----------|-----------|---------|----------|-----------|-----------|----------|----------|---------|------------------------------|-----------|------------|---------------|------------|------------|------------|-----------|-----------|-----------|---------|---------|---------|--------|-----------|-----------|--------|-------|--|--|--|--|
| 1                            |           |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          | 2       |                              |           |            |               |            |            |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
| H                            |           |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          | He      |                              |           |            |               |            |            |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
| Hydrogen                     |           |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          | Helium  |                              |           |            |               |            |            |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
| 1.00794                      |           |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          | 4.003   |                              |           |            |               |            |            |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
| 3                            | 4         |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          |         | 5                            | 6         | 7          | 8             | 9          | 10         |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
| Li                           | Be        |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          |         | B                            | C         | N          | O             | F          | Ne         |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
| Lithium                      | Beryllium |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          |         | Boron                        | Carbon    | Nitrogen   | Oxygen        | Fluorine   | Neon       |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
| 6.941                        | 9.012182  |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          |         | 10.811                       | 12.0107   | 14.00674   | 15.9994       | 18.9984032 | 20.1797    |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
| 11                           | 12        |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          |         | 13                           | 14        | 15         | 16            | 17         | 18         |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
| Na                           | Mg        |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          |         | Al                           | Si        | P          | S             | Cl         | Ar         |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
| Sodium                       | Magnesium |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          |         | Aluminum                     | Silicon   | Phosphorus | Sulfur        | Chlorine   | Argon      |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
| 22.989770                    | 24.3050   |           |          |          |          |           |        |           |          |           |         |          |           |           |          |          |         | 26.981538                    | 28.0855   | 30.973761  | 32.066        | 35.4527    | 39.948     |            |           |           |           |         |         |         |        |           |           |        |       |  |  |  |  |
| 19                           | 20        | 21        | 22       | 23       | 24       | 25        | 26     | 27        | 28       | 29        | 30      | 31       | 32        | 33        | 34       | 35       | 36      | 37                           | 38        | 39         | 40            | 41         | 42         | 43         | 44        | 45        | 46        | 47      | 48      | 49      | 50     | 51        | 52        | 53     | 54    |  |  |  |  |
| K                            | Ca        | Sc        | Ti       | V        | Cr       | Mn        | Fe     | Co        | Ni       | Cu        | Zn      | Ga       | Ge        | As        | Se       | Br       | Kr      | Rb                           | Sr        | Y          | Zr            | Nb         | Mo         | Tc         | Ru        | Rh        | Pd        | Ag      | Cd      | In      | Sn     | Sb        | Te        | I      | Xe    |  |  |  |  |
| Potassium                    | Calcium   | Scandium  | Titanium | Vanadium | Chromium | Manganese | Iron   | Cobalt    | Nickel   | Copper    | Zinc    | Gallium  | Germanium | Arsenic   | Selenium | Bromine  | Krypton | Rubidium                     | Strontium | Yttrium    | Zirconium     | Niobium    | Molybdenum | Technetium | Ruthenium | Rhodium   | Palladium | Silver  | Cadmium | Indium  | Tin    | Antimony  | Tellurium | Iodine | Xenon |  |  |  |  |
| 39.0983                      | 40.078    | 44.955910 | 47.867   | 50.9415  | 51.9961  | 54.938049 | 55.845 | 58.933200 | 58.6934  | 63.546    | 65.38   | 69.723   | 72.61     | 74.92160  | 78.96    | 79.904   | 83.80   | 85.4678                      | 87.62     | 88.90585   | 91.224        | 92.90638   | 95.94      | 101.07     | 106.42    | 107.8682  | 112.411   | 114.818 | 118.710 | 121.760 | 127.60 | 126.90447 | 131.29    |        |       |  |  |  |  |
| 55                           | 56        | 57        | 72       | 73       | 74       | 75        | 76     | 77        | 78       | 79        | 80      | 81       | 82        | 83        | 84       | 85       | 86      | 87                           | 88        | 89         | 104           | 105        | 106        | 107        | 108       | 109       | 110       | 111     | 112     | 113     | 114    |           |           |        |       |  |  |  |  |
| Cs                           | Ba        | La        | Hf       | Ta       | W        | Re        | Os     | Ir        | Pt       | Au        | Hg      | Tl       | Pb        | Bi        | Po       | At       | Rn      | Fr                           | Ra        | Ac         | Rf            | Db         | Sg         | Bh         | Hs        | Mt        |           |         |         |         |        |           |           |        |       |  |  |  |  |
| Cesium                       | Barium    | Lanthanum | Hafnium  | Tantalum | Tungsten | Rhenium   | Osmium | Iridium   | Platinum | Gold      | Mercury | Thallium | Lead      | Bismuth   | Polonium | Astatine | Radon   | Francium                     | Radium    | Actinium   | Rutherfordium | Dubnium    | Seaborgium | Bohrium    | Hassium   | Moscovium |           |         |         |         |        |           |           |        |       |  |  |  |  |
| 132.90545                    | 137.327   | 138.9055  | 178.49   | 180.9479 | 183.84   | 186.207   | 190.23 | 192.223   | 195.078  | 196.96655 | 200.59  | 204.3833 | 207.2     | 208.98038 | (209)    | (210)    | (222)   | (223)                        | (226)     | (227)      | (261)         | (262)      | (263)      | (264)      | (265)     | (266)     | (269)     | (272)   | (277)   |         |        |           |           |        |       |  |  |  |  |

1.2 The Periodic Table

Atomic Radii

The atomic radius is one-half the distance between nuclei of two atoms (just like the radius of a circle) when covalently bonded together.

Trends:

- 1. Atomic radius decreases from left to right within a period. This is caused by the increase in the number of protons and electrons across a period. One proton has a greater effect than one electron; thus, electrons are pulled towards the nucleus, resulting in a smaller radius.
- 2. Atomic radius increases from top to bottom within a group. This is caused by electron shielding.

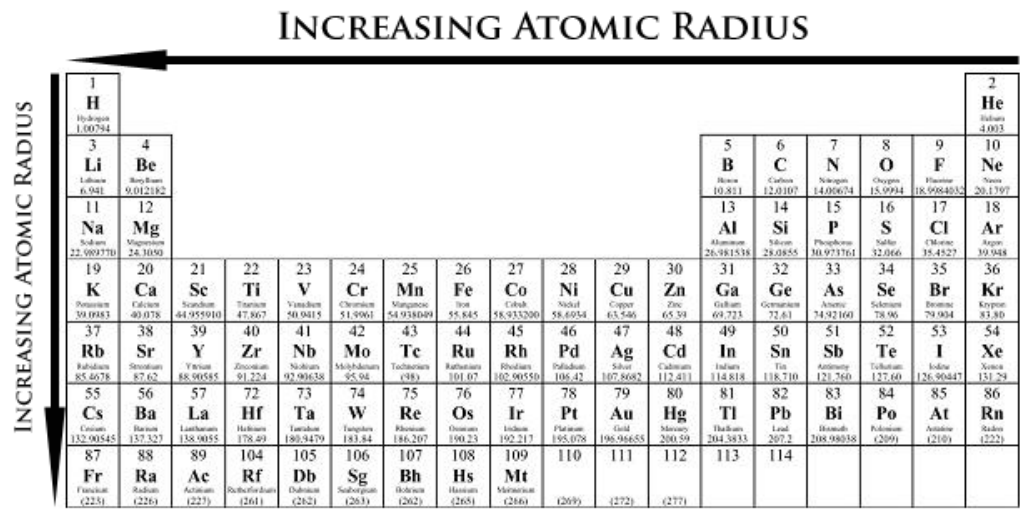


Figure 6. Periodic Table showing Atomic Radius Trend

## 1.2 The Periodic Table

### Melting Point

Melting point is the amount of energy required to break a bond(s) to change the solid phase of a substance to a liquid. Generally, the stronger the bond between the atoms of an element, the higher the energy requirement in breaking that bond.

Trends:

1. Metals generally possess a high melting point.
2. Most non-metals possess low melting points.
3. The non-metal carbon possesses the highest boiling point of all the elements. The semi-metal boron also possesses a high melting point.

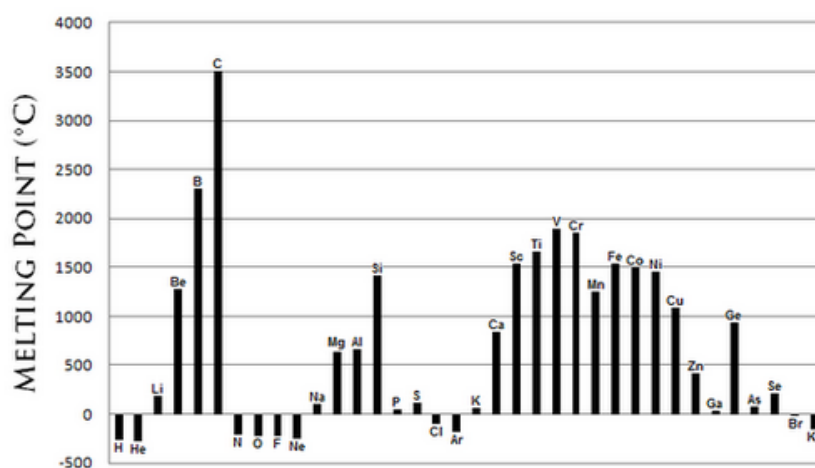


Figure 7. Chart of Melting Points of Various Elements



## 1.2 The Periodic Table

### Metallic Character

The metallic character of an element can be defined as how readily an atom can lose an electron and form a positive cation (thereby making it act like a metal). Remember this trend when we talk about metallic bonding in unit 2.

Trends:

1. Metallic characteristics decrease from left to right across a period. This is caused by the decrease in radius of the atom which allows the outer electrons to ionize more readily.
  2. Metallic characteristics increase down a group. Electron shielding causes the atomic radius to increase thus the outer electrons ionizes more readily than electrons in smaller atoms.
  3. Metallic character relates to the ability to lose electrons, and nonmetallic character relates to the ability to gain electrons.
- \*\*Another easier way to remember the trend of metallic character is:
- Move left across period and down the group: increase metallic character (heading towards alkali and alkaline metals)
  - Move right across period and up the group: decrease metallic character (heading towards nonmetals like noble gases)

INCREASING METALLIC CHARACTER

|  |   |  |  |  |  |   |  |   |   |   |  |   |                                       |  |   |  |  |   |   |   |                                      |   |   |  |  |   |  |   |  |   |  |
|--|---|--|--|--|--|---|--|---|---|---|--|---|---------------------------------------|--|---|--|--|---|---|---|--------------------------------------|---|---|--|--|---|--|---|--|---|--|
| 1<br><b>H</b><br>Hydrogen<br>1.00794   |   |  |  |  |  |   |  |   |   |   |  |   |                                       |  |   |  | 2<br><b>He</b><br>Helium<br>4.003          |   |   |   |                                      |   |   |  |  |   |  |   |  |   |  |
| 3<br><b>Li</b><br>Lithium<br>6.941     | 4<br><b>Be</b><br>Beryllium<br>9.012182 |  |  |  |  |   |  |   |   |   |  |   |                                       |  |   | 5<br><b>B</b><br>Boron<br>10.811         | 6<br><b>C</b><br>Carbon<br>12.0107         | 7<br><b>N</b><br>Nitrogen<br>14.0064      | 8<br><b>O</b><br>Oxygen<br>15.9994      | 9<br><b>F</b><br>Fluorine<br>18.9984032 | 10<br><b>Ne</b><br>Neon<br>20.1797   |   |   |  |  |   |  |   |  |   |  |
| 11<br><b>Na</b><br>Sodium<br>22.989770 | 12<br><b>Mg</b><br>Magnesium<br>24.3050 |  |  |  |  |   |  |   |   |   |  |   |                                       |  |   | 13<br><b>Al</b><br>Aluminum<br>26.981538 | 14<br><b>Si</b><br>Silicon<br>28.0855      | 15<br><b>P</b><br>Phosphorus<br>30.973761 | 16<br><b>S</b><br>Sulfur<br>32.066      | 17<br><b>Cl</b><br>Chlorine<br>35.4527  | 18<br><b>Ar</b><br>Argon<br>39.948   |   |   |  |  |   |  |   |  |   |  |
| 19<br><b>K</b><br>Potassium<br>39.0983 | 20<br><b>Ca</b><br>Calcium<br>40.078    | 21<br><b>Sc</b><br>Scandium<br>44.955910 | 22<br><b>Ti</b><br>Titanium<br>47.867  | 23<br><b>V</b><br>Vanadium<br>50.9415        | 24<br><b>Cr</b><br>Chromium<br>51.9961 | 25<br><b>Mn</b><br>Manganese<br>54.938049 | 26<br><b>Fe</b><br>Iron<br>55.845      | 27<br><b>Co</b><br>Cobalt<br>58.933200  | 28<br><b>Ni</b><br>Nickel<br>58.6934    | 29<br><b>Cu</b><br>Copper<br>63.546     | 30<br><b>Zn</b><br>Zinc<br>65.38           | 31<br><b>Ga</b><br>Gallium<br>69.723    | 32<br><b>Ge</b><br>Germanium<br>72.61 | 33<br><b>As</b><br>Arsenic<br>74.92160   | 34<br><b>Se</b><br>Selenium<br>78.96      | 35<br><b>Br</b><br>Bromine<br>79.904     | 36<br><b>Kr</b><br>Krypton<br>83.80        |   |   |   |                                      |   |   |  |  |   |  |   |  |   |  |
| 37<br><b>Rb</b><br>Rubidium<br>85.4678 | 38<br><b>Sr</b><br>Strontium<br>87.62   | 39<br><b>Y</b><br>Yttrium<br>88.90585    | 40<br><b>Zr</b><br>Zirconium<br>91.224 | 41<br><b>Nb</b><br>Niobium<br>92.90638       | 42<br><b>Mo</b><br>Molybdenum<br>95.94 | 43<br><b>Tc</b><br>Technetium<br>(98)     | 44<br><b>Ru</b><br>Ruthenium<br>101.07 | 45<br><b>Rh</b><br>Rhodium<br>102.90550 | 46<br><b>Pd</b><br>Palladium<br>106.42  | 47<br><b>Ag</b><br>Silver<br>107.8682   | 48<br><b>Cd</b><br>Cadmium<br>112.411      | 49<br><b>In</b><br>Indium<br>114.818    | 50<br><b>Sn</b><br>Tin<br>118.710     | 51<br><b>Sb</b><br>Antimony<br>121.760   | 52<br><b>Te</b><br>Tellurium<br>127.60    | 53<br><b>I</b><br>Iodine<br>126.90447    | 54<br><b>Xe</b><br>Xenon<br>131.29         |   |   |   |                                      |   |   |  |  |   |  |   |  |   |  |
| 55<br><b>Cs</b><br>Cesium<br>132.90545 | 56<br><b>Ba</b><br>Barium<br>137.327    | 57<br><b>La</b><br>Lanthanum<br>138.9055 | 58<br><b>Ce</b><br>Cerium<br>140.12    | 59<br><b>Pr</b><br>Praseodymium<br>140.90768 | 60<br><b>Nd</b><br>Neodymium<br>144.24 | 61<br><b>Pm</b><br>Promethium<br>(145)    | 62<br><b>Sm</b><br>Samarium<br>150.36  | 63<br><b>Eu</b><br>Europium<br>151.964  | 64<br><b>Gd</b><br>Gadolinium<br>157.25 | 65<br><b>Tb</b><br>Terbium<br>158.92535 | 66<br><b>Dy</b><br>Dysprosium<br>162.50014 | 67<br><b>Ho</b><br>Holmium<br>164.93033 | 68<br><b>Er</b><br>Erbium<br>167.259  | 69<br><b>Tm</b><br>Thulium<br>168.93032  | 70<br><b>Yb</b><br>Ytterbium<br>173.05468 | 71<br><b>Lu</b><br>Lutetium<br>174.967   | 72<br><b>Hf</b><br>Hafnium<br>178.49       | 73<br><b>Ta</b><br>Tantalum<br>180.94788  | 74<br><b>W</b><br>Tungsten<br>183.84    | 75<br><b>Re</b><br>Rhenium<br>186.207   | 76<br><b>Os</b><br>Osmium<br>190.23  | 77<br><b>Ir</b><br>Iridium<br>192.222   | 78<br><b>Pt</b><br>Platinum<br>195.078    | 79<br><b>Au</b><br>Gold<br>196.96655     | 80<br><b>Hg</b><br>Mercury<br>200.59     | 81<br><b>Tl</b><br>Thallium<br>204.3833 | 82<br><b>Pb</b><br>Lead<br>207.2       | 83<br><b>Bi</b><br>Bismuth<br>208.98038 | 84<br><b>Po</b><br>Polonium<br>(209)     | 85<br><b>At</b><br>Astatine<br>(210)    | 86<br><b>Rn</b><br>Radon<br>(222)      |
| 87<br><b>Fr</b><br>Francium<br>(223)   | 88<br><b>Ra</b><br>Radium<br>(226)      | 89<br><b>Ac</b><br>Actinium<br>(227)     | 90<br><b>Th</b><br>Thorium<br>(232)    | 91<br><b>Pa</b><br>Protactinium<br>(231)     | 92<br><b>U</b><br>Uranium<br>(238)     | 93<br><b>Np</b><br>Neptunium<br>(237)     | 94<br><b>Pu</b><br>Plutonium<br>(244)  | 95<br><b>Am</b><br>Americium<br>(243)   | 96<br><b>Cm</b><br>Curium<br>(247)      | 97<br><b>Bk</b><br>Berkelium<br>(247)   | 98<br><b>Cf</b><br>Californium<br>(251)    | 99<br><b>Es</b><br>Einsteinium<br>(252) | 100<br><b>Fm</b><br>Fermium<br>(257)  | 101<br><b>Md</b><br>Mendelevium<br>(258) | 102<br><b>No</b><br>Nobelium<br>(259)     | 103<br><b>Lr</b><br>Lawrencium<br>(260)  | 104<br><b>Rf</b><br>Rutherfordium<br>(261) | 105<br><b>Db</b><br>Dubnium<br>(262)      | 106<br><b>Sg</b><br>Seaborgium<br>(263) | 107<br><b>Bh</b><br>Bohrium<br>(264)    | 108<br><b>Hs</b><br>Hassium<br>(265) | 109<br><b>Mt</b><br>Meitnerium<br>(266) | 110<br><b>Ds</b><br>Darmstadtium<br>(271) | 111<br><b>Rg</b><br>Roentgenium<br>(272) | 112<br><b>Cn</b><br>Copernicium<br>(285) | 113<br><b>Nh</b><br>Nihonium<br>(286)   | 114<br><b>Fl</b><br>Flerovium<br>(289) | 115<br><b>Mc</b><br>Moscovium<br>(290)  | 116<br><b>Lv</b><br>Livermorium<br>(293) | 117<br><b>Ts</b><br>Tennessine<br>(294) | 118<br><b>Og</b><br>Oganesson<br>(294) |

Figure 8. Periodic Table of Metallic Character Trend

