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November 7, 2022 11:37 AM

Science 9 – Chemistry Topic 2.2 – C3: organizes elements in groups and periods.

Mendeleev's periodic table was ordered by increasing atomic mass :

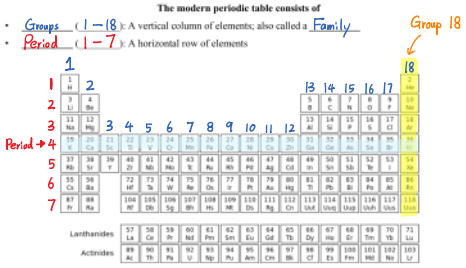
- Did not work perfectly – some elements were out of order so they would fit in a family that had similar properties

Modern periodic table is ordered by increasing atomic number:

- Henry Moseley determined an element's atomic number (the number of protons in an atom)
- When elements are arranged according to increasing atomic number, the elements fit perfectly and do not require re-ordering

The modern periodic table consists of

- Groups (1 – 18): A vertical column of elements; also called a Family
- Period (1 – 7): A horizontal row of elements



Example: which element is in period 4, group 8? Fe Iron

You try: which element is in period 3, group 16? S Sulphur

What is in the box?

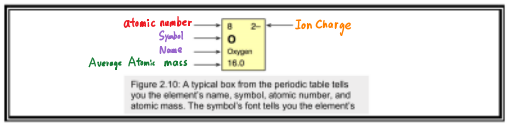


Figure 2.10: A typical box from the periodic table tells you the element's name, symbol, atomic number, and atomic mass. The symbol's font tells you the element's

22 +4 **Ti** Titanium 47.88

Atomic Number	The atomic number tells you the number of proton in the nucleus	22
# of protons		22
# of electrons	An atom is **neutral** atom # of electron = # of proton	22
Average Atomic Mass	The atomic mass is not an integer. Many elements have more than one isotope Isotope: an atom with the same number of protons, but a different number of neutron. 6p 6n C-12 6p 8n C-14 The **atomic mass** of an element is the average of the mass numbers of all the naturally occurring isotopes.	47.88
# of Neutrons **Rounded Atomic Mass**	47.88 Mass number = proton + neutrons (p + n) → 48 Neutrons = Rounded Mass – proton Number n = 48 – 22 = 26	26 neutrons
Ion Charge	The electric charge of its atoms when they gain or lose electrons.	+4

Atoms are neutral # p^+ = # e^-

28 **Ni** Nickel 58.693	
Atomic Number	28
# of protons	28
# of electrons	28
Average Atomic Mass	58.693
# of Neutrons	31

59 – 28 = 31 (Mass – proton)

82 **Pb** Lead 207.2	
Atomic Number	82
# of protons	82
# of electrons	82
Average Atomic Mass	207.2
# of Neutrons	125

207 – 82

79 **Au** Gold 196.967	
Atomic Number	79
# of protons	79
# of electrons	79
Average Atomic Mass	196.967
# of Neutrons	118

197 – 79

36 **Kr** Krypton 83.798	
Atomic Number	36
# of protons	36
# of electrons	36
Average Atomic Mass	83.798
# of Neutrons	48

84 – 36

① Work on "What is in the box" WS Both side

② HW: WB p.59–60

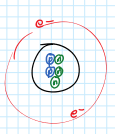
atomic number = number of proton

27 **Co** 58.9 (Average Atomic Mass – round)

proton = 27

electron = 27

neutron = 59 – 27 = 32 (mass – protons)



mass # 2 + 3 = 5 (P n ?)

47 +1 **Ag** 107.9 Silver

proton 47

electron 47

neutron = 61 (108 – 47)