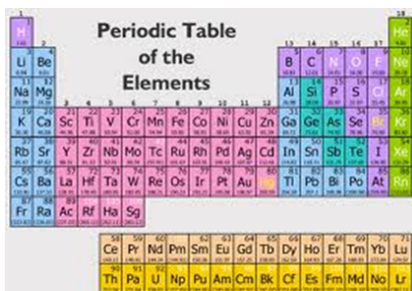


4.4 Development of the Periodic Table

Start Your Time Machines!

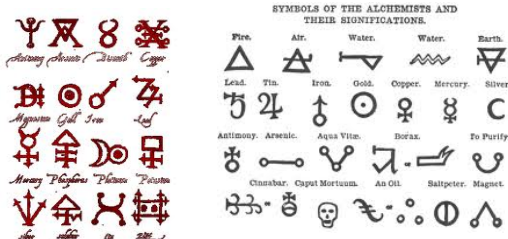


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Alchemists

Medieval chemists tried to turn base metals (Fe, Pb) to gold. They also tried making an 'elixir of life' bestowing immortality upon the consumer.

Several symbols they used for their ingredients:



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Development

The periodic table is the result of many contributions.

Antoine Lavoisier made an organized list of all 33 elements known in the late 1700's.

Later, more elements were discovered by electrolysis (electrical separation).



Mar 5-12:38 PM

John Newlands



Organized elements by atomic mass (1866).

Noted Law of Octaves (like music) – Every 8th element had similar properties.

H	Li	Ca	B	C	N	O
F	Na	Mg	Al	Si	P	S
Cl	K	Ca	Cr	Ti	Mn	Fe
Co, Ni	Cu	Zn	Y	In	As	Se
Br	Rb	Sr	Ce, La	Zr	Di, Mo	Ro, Ru
Pd	Ag	Cd	U	Sn	Sb	Te
I	Cs	Ba, V	Ta	W	Nb	Au
Pt, Ir	II	Pb	Th	Hg	Bi	Th

Mar 5-12:38 PM

Lothar Meyer & Dmitry Mendeleev

Both demonstrated connection between properties and atomic mass.

Mendeleev published first → got credit.

Left blank spaces between elements where undiscovered elements could go.



VS.



Meyer

Mendeleev

Library of Congress

J. Mendeleev

Mar 5-12:38 PM

Henry Moseley

Realized ordering by atomic mass led to errors in properties. Ex: Ar & K switched. He determined that each element has a unique number of protons (1913). Arranged elements by atomic number → clear periodic trends emerged.



Henry Moseley Rabbit Hole!

Group	I	II	III	IV	V	VI	VII	VIII
H	1							
He	2	3	4	5	6	7	8	9
Ne	10	11	12	13	14	15	16	17
Ar	18	19	20	21	22	23	24	25
Kr	36	37	38	39	40	41	42	43
Xe	54	55	56	57	58	59	60	61
Rn	86	87	88	89	90	91	92	93


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Chem Unit 4.4 Notes - Dvp. of the Table.notebook

Henry Moseley

Moseley died in the campaign of Gallipoli during WWI.
His death prompted the British government to forbid prominent scientists from enlisting in front-line positions. Other governments followed this policy. He was 27.

Further Down the Rabbit Hole!!




It was in the Great War to end all wars he fell,
Amongst the rocky, godforsaken Dardanelles.
He but young lad when his death time came,
Yet one already of scientific fame.
So before Queen and Country took his soul,
Him had taught us what to know:
And if you think this all a fancy fable,
Simply peer into the periodic table.


Mar 5-12:38 PM

1. Match the scientist to his achievement.


Newlands




Moseley




Mendeleev



Lavoisier



Meyer



Didn't publish his results in time for lasting fame.

Made organized list of 33 elements known in late 1700's

Published periodic table that's in use today.

Noted Law of Octaves.

Ordered elements by atomic number rather than mass.

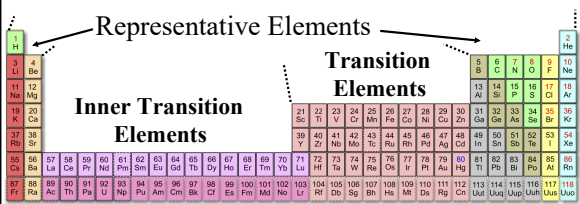
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Terms of the Table

Representative Elements – Groups 1 & 2, 3 - 8
Named this because of their valence configuration.

Transition Elements – Between 2 and 3 (B series)

Inner Transition Elements - Lanthanides & Actinides.



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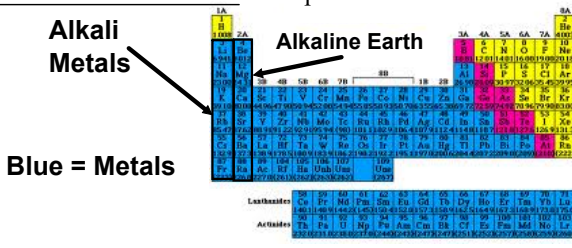
Types of Elements: Metals

Metals are found on the left side of the periodic table.

Metals: Generally shiny, solid @ room temperature, good conductors of heat & electricity.

Alkali Metals Group 1 elements except H. Very reactive!

Alkaline Earth Metals Group 2. Also reactive.



Blue = Metals

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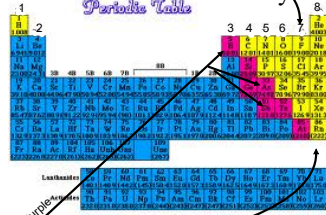
Non-Metals

Non-Metals: Upper right side of table (and hydrogen). Brittle solids or gases (one liquid). Conduct heat and electricity poorly.

Halogens Group 7. Very reactive.

Noble Gases Group 8. Very unreactive.

Metalloids Semi-metals. Properties of metals and nonmetals. Ex: Si and Ge used in microchips.



Mar 5-12:38 PM

2. Categorize the following elements:

Lost Elements

Metal	
Au Ti	
Akali Metal	Alkaline Earth Metal
K Na	Mg Ca

Metalloid	
Si Ge	

Non-metal	
H S	
Halogen	Noble Gas
F Cl	Ne Rn

Oct 22-7:03 AM

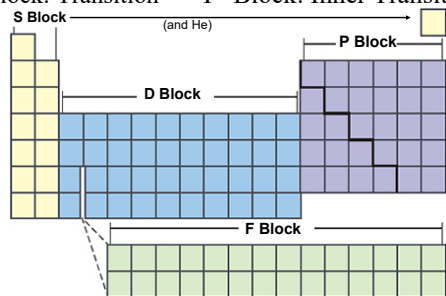
Chem Unit 4.4 Notes - Dvp. of the Table.notebook

S, P, D, F Blocks.

The Periodic Table is arranged according to where electrons are filing in to different sublevels:

S-Block: Groups 1 & 2 P-Block: Groups 3 - 8

D- Block: Transition F- Block: Inner Transition



SPDF

3. Green Circle the S-Block.

Red Polka Dot the F-Block.

Black Box the D-Block.

Blue checker the P-Block

A full periodic table with the following color-coding:

- S-block (Yellow):** Groups 1 and 2, and Helium.
- P-block (Purple):** Groups 13 through 18.
- D-block (Blue):** Transition metals (Groups 3-10).
- F-block (Green):** Lanthanide and Actinide series.

Oct 22-3:45 PM

Homework

Preview 4.5

4.4 Problems in your Booklet

Due: Next Class

DO Configuration Essential Skill - P. 60

- Practice for Friday's Quiz

Mar 5-12:38 PM