

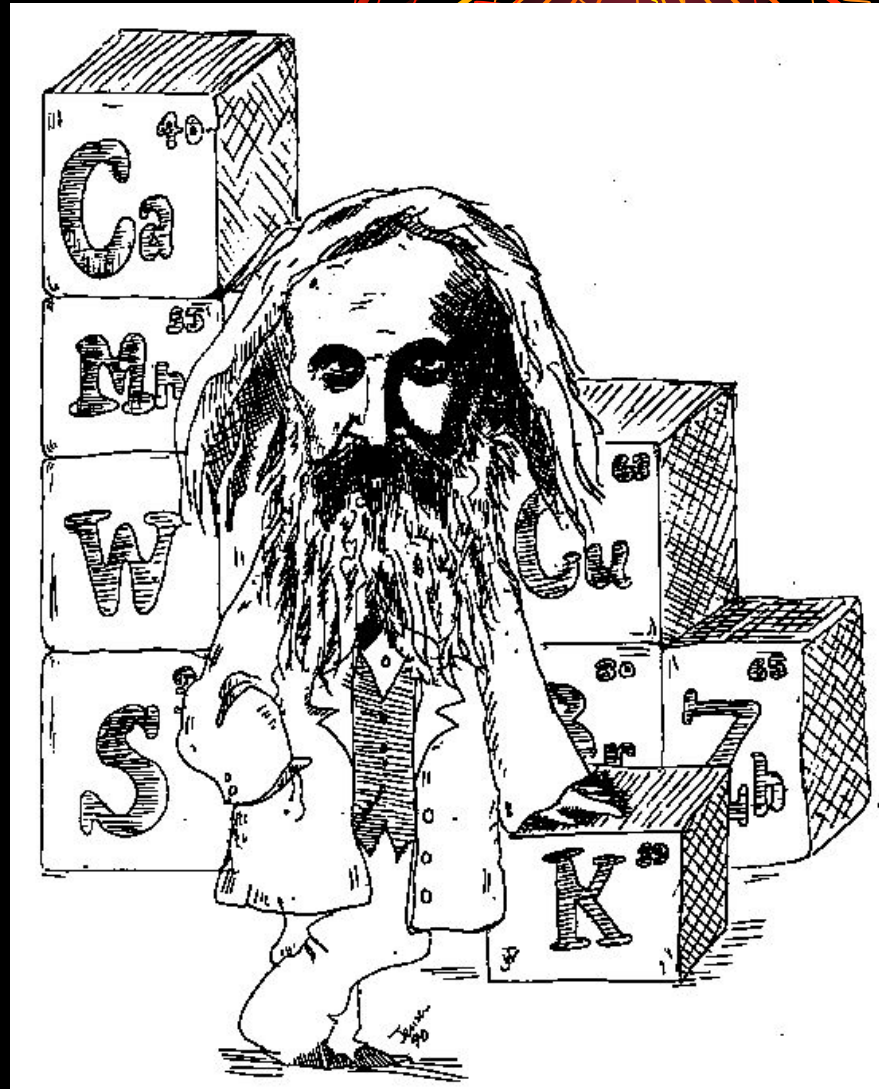


Trends on the Periodic Table

More than just a table!

The First Periodic Table

- Dimitri Mendeleev was one of the first to publish a table using these properties to arrange the elements.
 - He placed similar elements in the same vertical column.
 - He left open spaces on his chart for elements he predicted would someday be found but had not been discovered at that time.



The Periodic Law



- He developed the idea of the Periodic Law: “When elements are arranged in order of increasing atomic weight their properties are repeated periodically.”
 - Today we know that atomic number is a better way to structure the periodic table. Mendeleev and other early researchers did not know about protons and neutrons and isotopes.

FAMILIES on the Table

- **Families (a.k.a. Groups)**- a **vertical column** on the periodic table in which elements have **similar chemical reactivity**

1																	2
IA																	0
1	2											10	11	12			
H	He											Ne	Ar	Kr	Xe	Rn	
3	4											5	6	7	8	9	10
Li	Be											B	C	N	O	F	Ne
11	12	13	14	15	16	17	18										
Na	Mg	Al	Si	P	S	Cl	Ar										
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
K	Ca	Sc	Ti	Y	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Cs	Br	La*	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
87	88	89	104	105	106	107	108	109	110								
Fr	Ra	Ac*	Rf	Ha	106	107	108	109	110								

*Lanthinide Series	58	59	60	61	62	63	64	65	66	67	68	69	70	Lu
	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
*Actinide Series	90	91	92	93	94	95	96	97	98	99	100	101	102	Lr
	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Group 1 – Alkali metals

Include Li, Na, K, etc.

- **most chemically reactive of the metals**
(must be stored under oil as they will react with air)
- **react explosively with water**
- **are so soft they can be cut with a knife**



YOU'VE GOT TO SEE THIS!

YOU TUBE CLIP: K + H₂O

Group 2 – Alkaline Earth metals



Includes Be, Ca, Mg, etc.

- **are very chemically reactive and are never found free in nature (same as alkali metals)**
- **React with water to produce alkaline (i.e. basic) solutions**



Group 17 – Halogen family



- **named from “salt former”, these elements exhibit all 3 physical states at room temp!**
- **are highly reactive with metals, especially alkali metals (as a result they are highly toxic)**



Group 18 - Noble gases

Include He, Ne, Xe, etc

- **are all EXTREMELY STABLE and only rarely react to form compounds**
 - **Sometimes called INERT GASES**
- **all are gases which are naturally occurring**
- **when given energy (with electricity or extreme heat) each noble gas gives off a unique colour...**

He

Ne

Ar

Kr

Xe

PERIODS on the Table



- Periods- a horizontal row on the periodic table
 - As you go across a row from left to right you find that cations increase in positive charge until you hit the carbon-family
 - As you go across a row from right to left you find that anions increase in negative charge until you hit the carbon-family