

ELEMENTS

Notebook Page 35

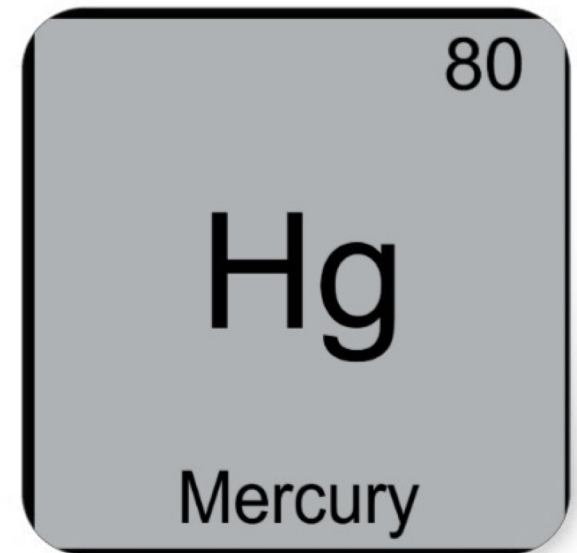
Chapter 1.3

The Periodic Table

- Dmitri Mendeleev 1870
 - ▣ 60 known elements and their densities, boiling points, and melting points
 - ▣ Arranged elements according to their atomic mass
 - ▣ He left gaps for missing elements and predicted their properties
- “Periodic” = the repeating pattern of certain properties of the elements
- Vertical columns = Groups or families
 - ▣ Numbered 1-18
- Horizontal rows = Periods
- Two rows below keep the table from becoming too wide
 - ▣ Lanthanides & Actinides

Element Symbols

- Each element has a unique symbol
 - ▣ Some symbols are related to the English name
 - Carbon
 - Hydrogen
 - Oxygen
 - ▣ Others are derived from older Latin or German names
 - Lead = Pb (plumbum)
 - Mercury = Hg (Hydrargyrum)
 - Gold = Au (Aurum)



Element Symbols (continued)

Name	Potassium	
Symbol	K	
Atomic Mass	39.0983	Atomic Number
Density	0.86	19
Electron Configuration	[Ar]4s	Half Life
Boiling Point	760°	1.28x10 ⁰ y
Melting Point	63.25°	# of natural isotopes
		1
		# of stable isotopes
		2
		Oxidation State
		1

Periods

- **Horizontal** (left to right)
- There are 7 periods on the table.
- **Metals on the left side**
- **Goes from most reactive to least reactive**
- **Semimetals between metals and non-metals**
- **Larger mass left to right and larger going down**

Groups

- ▣ Vertical (up to down)
- ▣ Also called a “family”
- ▣ Similar characteristics
- ▣ Alkali metals (group 1)..what did they all do?

Lanthanides & Actinides

- **Bottom two rows.**
- These are radioactive metal elements.
- Don't fit in the periodic table without making it a weird shape.

Generally

Metals

Non-Metals

Metalloids

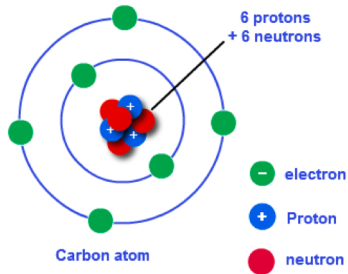


Calcium:

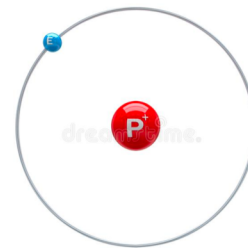


Element vs. Atom

- What is the difference between an element and an atom?
- An **element** is a specific type of **atom**.
- An atom refers to the size, mostly.
- Example:

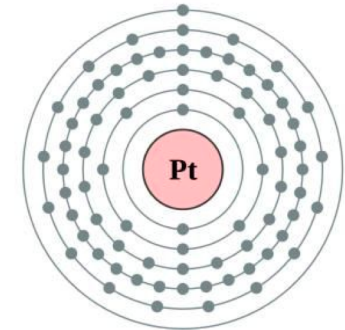


Carbon Atom



Hydrogen Atom

78: Platinum 2,8,18,32,17,1



Platinum Atom

How small is an atom?

- <https://www.youtube.com/watch?v=0RRVV4Diomg>

Time to color...

Periodic Table Coloring Activity

		Nonmetals		Metals										Metalloids																														
1	IA	1	2											13	14	15	16	17	18																									
1	H	3	4											5	6	7	8	9	10																									
	1.00794	Li	Be											B	C	N	O	F	Ne																									
2		6.941	9.0122											10.811	12.0107	14.0067	15.9994	18.998	20.180																									
3	11	12	3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18											
	Na	Mg	Al	Si	P	S	Cl	Ar											K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr								
	22.9898	24.305	26.9815	28.0855	30.9738	32.06	35.453	39.948	39.0983	40.078	44.956	47.867	50.942	51.996	54.938	55.845	58.933	58.693	63.546	65.39	69.723	72.61	74.922	78.96	79.904	83.80	85.468	87.62	88.906	91.224	92.906	95.94	98.906	101.07	102.91	106.42	107.87	112.41	114.82	118.71	121.76	127.60	126.905	131.29
4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36																										
	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr																										
5	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																										
	85.468	87.62	88.906	91.224	92.906	95.94	(98)	101.07	102.91	106.42	107.87	112.41	114.82	118.71	121.76	127.60	126.905	131.29																										
6	55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86																										
	Cs	Ba	La*	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn																										
	132.905	137.327	138.91	178.49	180.95	183.84	186.21	190.23	192.22	195.08	196.97	200.59	204.38	207.2	208.98	(209)	(210)	(222)																										
7	87	88	89**	104	105	106	107	108	109																																			
	Fr	Ra	Ac**	Rf	Db	Sg	Bh	Hs	Mt																																			
	(223)	(226)	(227)	(261)	(262)	(263)	(264)	(265)	(268)																																			
*Lanthanides		58	59	60	61	62	63	64	65	66	67	68	69	70	71																													
		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu																													
		140.12	140.91	144.24	(145)	150.36	151.96	157.25	158.93	162.50	164.93	167.26	168.93	173.04	174.97																													
**Actinides		90	91	92	93	94	95	96	97	98	99	100	101	102	103																													
		Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr																													
		232.04	231.04	238.03	(237)	(244)	(243)	(247)	(247)	(251)	(252)	(257)	(258)	(259)	(262)																													