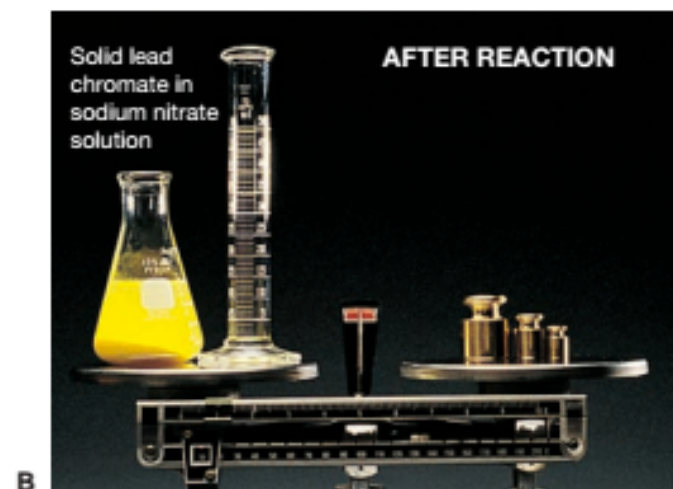
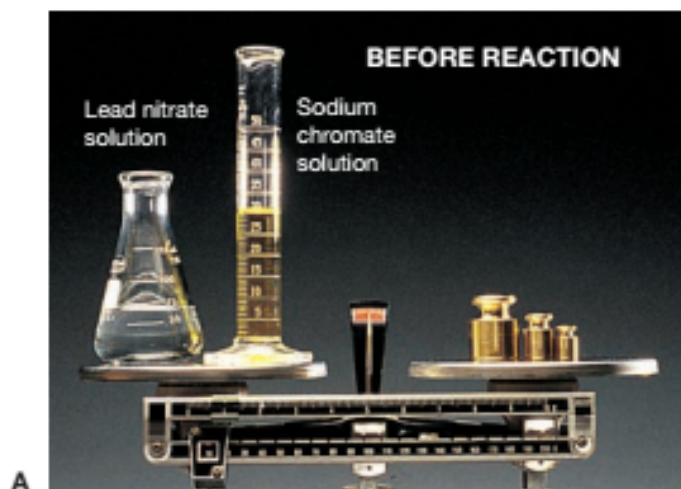
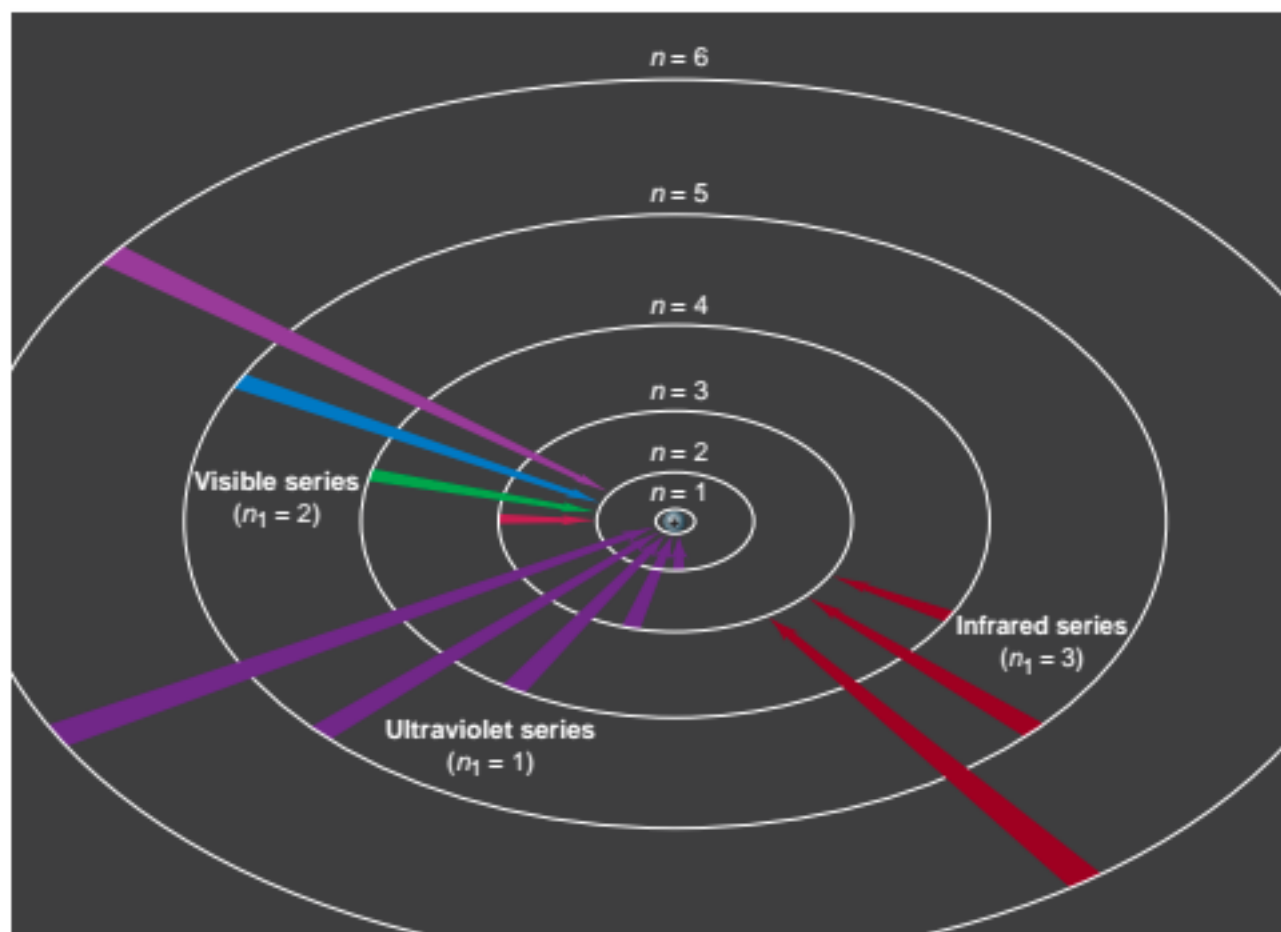
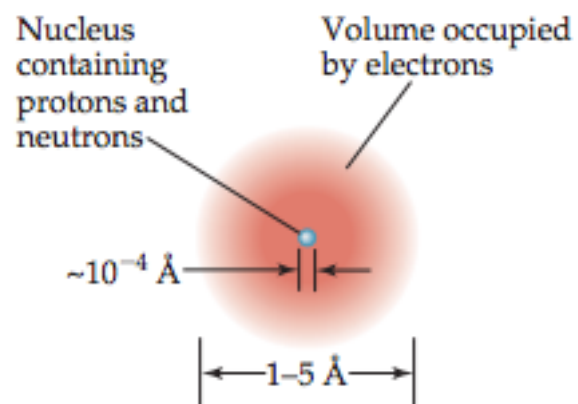


Chapter 2. Atoms, Molecules and Ions



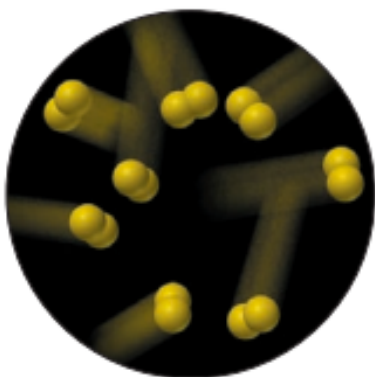
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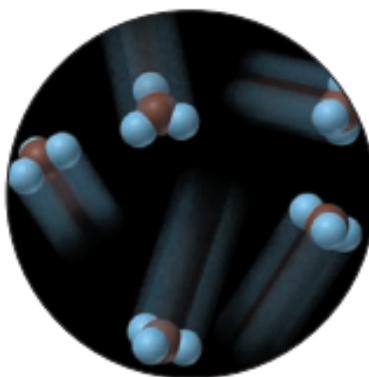
Chapter 2. Atoms, Molecules and Ions



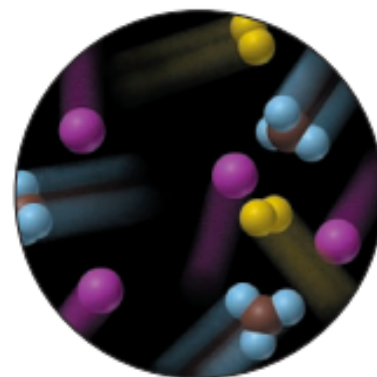
A Atoms of an element



B Molecules of an element



C Molecules of a compound



D Mixture of two elements
and a compound

Chapter 2. At

MAIN-GROUP ELEMENTS

Legend:

- Metals (main-group)
- Metals (transition)
- Metals (inner transition)
- Metalloids
- Nonmetals

MAIN-GROUP ELEMENTS																		MAIN-GROUP ELEMENTS														
1A (1)																		8A (18)														
1	1																	2														
	H																	He														
	1.008																	4.003														
2	3	4															5	6	7	8	9	10										
	Li	Be															B	C	N	O	F	Ne										
	6.941	9.012															10.81	12.01	14.01	16.00	19.00	20.18										
TRANSITION ELEMENTS																																
3	11	12	3B (3)	4B (4)	5B (5)	6B (6)	7B (7)	(8)	8B (9)	(10)	1B (11)	2B (12)	13	14	15	16	17	18														
	Na	Mg											Al	Si	P	S	Cl	Ar														
	22.99	24.31											26.98	28.09	30.97	32.07	35.45	39.95														
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														
	39.10	40.08	44.96	47.88	50.94	52.00	54.94	55.85	58.93	58.69	63.55	65.41	69.72	72.61	74.92	78.96	79.90	83.80														
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														
	85.47	87.62	88.91	91.22	92.91	95.94	(98)	101.1	102.9	106.4	107.9	112.4	114.8	118.7	121.8	127.6	126.9	131.3														
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														
	132.9	137.3	138.9	178.5	180.9	183.9	186.2	190.2	192.2	195.1	197.0	200.6	204.4	207.2	209.0	(209)	(210)	(222)														
7	87	88	89	104	105	106	107	108	109	110	111	112	113	114	115	116																
	Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg																					
	(223)	(226)	(227)	(263)	(262)	(266)	(267)	(277)	(268)	(281)	(272)	(285)	(284)	(289)	(288)	(292)																
INNER TRANSITION ELEMENTS																																
6	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																	
		140.1	140.9	144.2	(145)	150.4	152.0	157.3	158.9	162.5	164.9	167.3	168.9	173.0	175.0																	
7	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																	
		232.0	(231)	238.0	(237)	(242)	(243)	(247)	(247)	(251)	(252)	(257)	(258)	(259)	(260)																	

Figure 2.9 The modern periodic table. The table consists of element boxes arranged by *increasing* atomic number into groups (vertical columns) and periods (horizontal rows). Each box contains the atomic number, atomic symbol, and atomic mass. (A mass in parentheses is the mass number of the most stable isotope of that element.) The periods are numbered 1 to 7. The groups (sometimes called *families*) have a number-letter designation and a new group number in parentheses. The A groups are the main-group elements; the B groups are the transition elements. Two series of inner transition elements are

placed below the main body of the table but actually fit between the elements indicated. Metals lie below and to the left of the thick "staircase" line [top of 3A(13) to bottom of 6A(16) in Period 6] and include main-group metals (*purple-blue*), transition elements (*blue*), and inner transition elements (*gray-blue*). Nonmetals (*yellow*) lie to the right of the line. Metalloids (*green*) lie along the line. We discuss the placement of hydrogen in Chapter 14. As of mid-2007, elements 112–116 had not been named.

Chapter 2. Atoms, Molecules and Ions

	1A (1)	2A (2)											3A (13)	4A (14)	5A (15)	6A (16)	7A (17)	8A (18)	
1	H																		
2													B	C	N	O	F		
3	Na	Mg	3B (3)	4B (4)	5B (5)	6B (6)	7B (7)	8B (8) (9) (10)			1B (11)	2B (12)		Si	P	S	Cl		
4	K	Ca			V	Cr	Mn	Fe	Co	Ni	Cu	Zn			As	Se			
5						Mo								Sn			I		

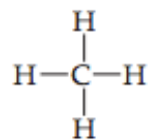
	Building-block elements
	Major minerals
	Trace elements

Figure 2.17 A biological periodic table. The building-block elements and major minerals are required by all organisms. Most organisms, including humans, require the trace elements as well. Many other elements (not shown) are found in organisms but have no known role.

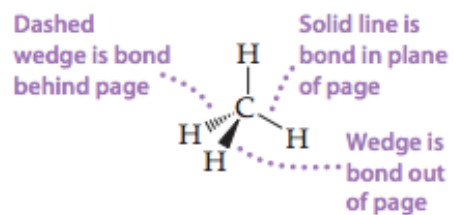
Chapter 2. Atoms, Molecules an



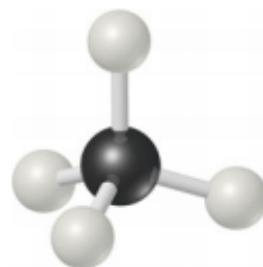
Molecular formula



Structural formula



Perspective drawing



Ball-and-stick model



Space-filling model