CHAPTER 4

(2) disovery of then-unknown elements, learned how to prepare certain acids,

(4) III, according to your periodic table in the text, exist.
88 elements occur naturally, the rest are man-made.
Most common elements (from p. 87): oxygen, silicon, aluminum, iron, calcium.

(6) Abundance in living things should be abut the same as the abundance in humans.
NO, the abundance of elements in humans isn't the same as abundance of elements in the earth as a whole, which is mostly made up of non-living stuff.

(8) My favorites (?):
Fe iron Sn tin
Pb lead Na Sodium Ag silver
(10) (a) H (b) Fe (c) Mg (d) Ca (e) Au (f) He

(12) iridium
Ta
Bi
plutonium
francium
At

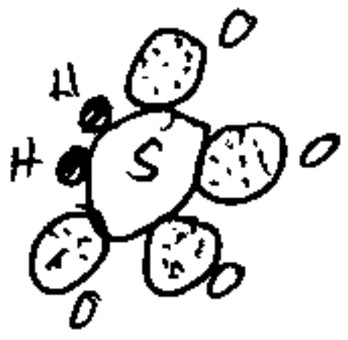
(14) (a) cobalt
(b) silver
(c) chlorine
(d) aluminum
(e) zinc
(f) platinum
(g) chromium
(h) sodium

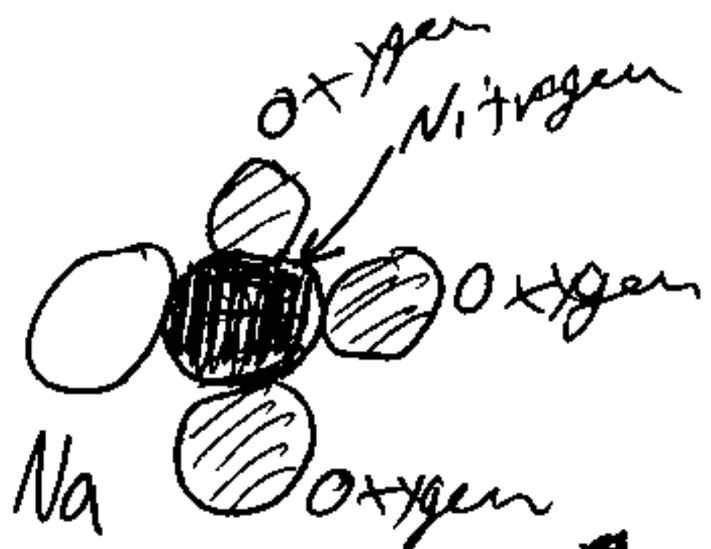
CHAPTER 4

(16) L.O.C.C. = a substance always has the same composition, no matter how much of the substance there is or where it comes from. Example: water is always found to have twice as many H atoms as O atoms (H_2O).

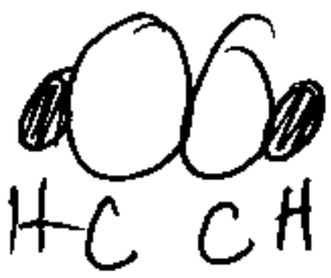
(18) This can only be true if every atom has the same average weight, more or less.

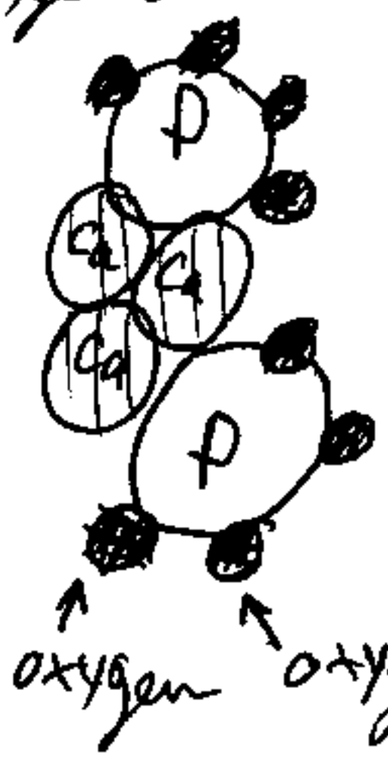
(20) (a) 

(b) 

(c) 

(d) 

(e) 

(F) 

(22) (a) False. α-particles are positively charged. Thus, they were deflected by something positive, because like charges repel. Also, because most of the α-particles went straight through the metal, he concluded that the gold atoms were mostly empty space.

(b) similar masses = false. 1 electron is about 1,836 x lighter than a proton.

opposite charges = true.

(c) True.

CHAPTER 4

(24) neutrons

(26) neutron, electron

(28) electrons, electron cloud, valence electrons, valence shell, etc. ← any of these answers

(30) false. Mass # = # p^+ + # n^0. The # of p^+ is called ATOMIC NUMBER.

(32) MASS #.

(34) NO. Isotopes of the same element have the same # of p^+, but different #'s of n^0. Example: C-14 and C-12 are both carbon, because both have $6\ p^+$ in the nucleus. But C-14 has $8\ n^0$, & C-12 has $6\ n^0$.

(36)
- (a) 37
- (b) 23
- (c) 46
- (d) 30
- (e) 53
- (f) 95
- (g) 83
- (h) 42

(38) (a) Z = atomic # = 25
thus, it is Mn.
mass # → 55
$^{55}_{25}Mn$
↑ atomic #

(b) $^{25}_{12}Mg$ mass # = $p^+ + n^0$
$= 12^+ \quad 13$
$= 25$

(38) (c) $^{40}_{20}Ca$

(d) $^{56}_{26}Fe$ ← 56
26 + 30 = 56

(e) $^{238}_{92}U$ ← 238
146 + 92 = 238

(f) $^{7}_{3}Li$

(39) Problem should read: "uncharged"
↑ R

	p^+	n^0	e^-
(a)	94	150	94
(b)	95	146	95
(c)	89	138	89
(d)	55	77	55
(e)	77	116	77
(f)	25	31	25

CHAPTER 4

(40)

	p^+	no^o	e^-
(a) $^{60}_{27}Co$	27	33	27
(b) $^{33}_{16}S$	16	17	16
(c) $^{10}_{4}Be$	4	6	4
(d) $^{40}_{18}Ar$	18	22	18
(e) $^{23}_{11}Na$	11	12	11
(f) $^{84}_{36}Kr$	36	48	36

(42)

Name	n^o	Z	mass #	Symbol
nitrogen	6	7	13	$^{13}_{7}N$
nitrogen	7	7	14	$^{14}_{7}N$
Lead	124	82	206	$^{206}_{82}Pb$
iron	31	26	57	$^{57}_{26}Fe$
krypton	48	36	84	$^{84}_{36}Kr$

(44) False horizontal = ⟷ = periods
vertical = ↕ = families or groups. Elements in the same vertical column do have similar properties, though.

(46) Left of the staircase. More metals, by far.

(48) chlorine, fluorine, hydrogen, neon, helium, etc.

(50) For the most part, the elements that have a "side of their box" touching the staircase are metalloids. silicon & germanium.

(52)

@ Kr	8A or 18	Noble gases
Br	7A or 17	halogens
K	1A or 1	alkali metals
Al	3A or 13	boron group

Na	1A or 1	alkali metals
Ba	2A or 2	alkaline earths
Ne	8A or 18	noble gases
Fl	7A or 17	halogens

CHAPTER 4

(54)

	Symbol	Z	Group #	classif.
rubidium	Rb	37	1A or 1	Metal
(b) germanium	Ge	32	4A or 14	metalloid
(c) magnesium	Mg	12	2A or 2	metal
(d) titanium	Ti	22	4B or 4	metal
(e) iodine	I	53	7A or 17	nonmetal

(56) combined
Because most elements are quite reactive... this reactivity is due to their incomplete outer shell of e⁻'s.

(58) "Group 8", also known as group 8A or group 18 to the rest of the world, is made up of unreactive (a.k.a. inert) elements. Noble = "does not associate with others."

(60) Diatomic: H_2, Cl_2, F_2 Monatomic: He, Ne, Kr

(62) Chlorine (64) diamond (according to your book)
*coke is also acceptable (amorphas form)

(66) electrons.
*poor parallel structure in second half of this sentence.

(68) 2^+ (or +2) (70) -ide (72) nonmetallic (74)

	p+	e⁻	Formula
(a) Fe^{2+}	26	24	$FeCl_2$
(b) Fe^{3+}	26	23	$FeCl_3$
(c) Ba^{2+}	56	54	$BaCl_2$
(d) Cs^+	55	54	$CsCl$

$Fe^{2+}_1 Cl^-_2$ ⇩ Fe_1Cl_2 ⇩ $FeCl_2$

	p+	e⁻	Formula
(e) S^{2-}	16	18	Na_2S
(f) P^{3-}	15	18	Na_3P
(g) Br^-	35	36	$NaBr$
(h) O^{2-}	8	10	Na_2O

CHAPTER 4

(76) (a) $Sr \rightarrow Sr^{2+} + \boxed{2e^-}$ (b) $Se + \boxed{2e^-} \rightarrow Se^{2-}$

(c) $Fe \rightarrow Fe^{2+} + \boxed{2e^-}$ (d) $P + \boxed{3e^-} \rightarrow P^{3-}$

(e) $Br + \boxed{1e^-} \rightarrow Br^-$ (f) $Au \rightarrow Au^{3+} + \boxed{3e^-}$

(78) (a) Ra^{2+} (b) Te^{2-} (c) I^- (d) Fr^+ (e) At^- (f) Rn

Rn should not form an ion.

(80) Sodium chloride dissolves in water to produce + and − ions.
$NaCl \xrightarrow{water} Na^+ + Cl^-$. sugar does not fall apart into ions when it dissolves. Without these charged ions, water does not conduct electricity very well.

(82) The reason the compounds are "held together" is due to the attraction of the (+) parts to the (−) parts. These compounds are most stable when (+) and (−) charges are balanced. When the charges are balanced, the net charge is zero on the compound.

(84) (a) Ba^{2+} Se^{2-} → Ba_2Se_2 → answer → $\boxed{BaSe}$

(b) Ca^{2+} I^{-1} → Ca_1I_2 → Answer → $\boxed{CaI_2}$

(c) K_2S

(d) Sn^{4+} O^{2-} → Sn_2O_4 → answer ← $\boxed{SnO_2}$

(e) SnO

(f) Pb_3P_4

(g) Pb_3N_2

(h) AlI_3