
 NUMERICAL ANSWERS TO ASSIGNED TUTORIAL PROBLEM SETS FOR CHEM205
 FROM KOTZ & TREICHEL'S CHEMISTRY & CHEMICAL REACTIVITY, 6th Ed.

NOTE: the answers from Ch.2 have not been verified – please report any errors.

Ch.	Q#	Answer	Units	SFs	Comments
2	2				see section 2.1
2	4				see Figure 2.8
2	8				refer to periodic table & start of section 2.6
2	12a				¹⁹ ₉ F (note: the numbers are supposed to be on top of each other...)
2	12b				⁵² ₂₄ Cr
2	12c				¹³² ₅₄ Xe
2	14a				6e ⁻ , 6p ⁺ , 7n
2	14b				29e ⁻ , 29p ⁺ , 34n
2	14c				83e ⁻ , 83p ⁺ , 122n
2	18				isotopes of X: ¹⁹ ₉ X, ²⁰ ₉ X, ²¹ ₉ X
2	22	24.31	amu	4	
2	26	57.20	%	4	¹²¹ Sb (SF based on using avg. Sb mass 121.760 amu - Kotz's Per.Table)
2	26	42.80	%	4	¹²³ Sb
2	28a	835	g	3	Au
2	28b	62.4	g	3	He
2	28c	12	g	2	Pt
2	28d	0.0888	g	3	Pu
2	30a	0.696	mol	3	Na
2	30b	7.38x10 ⁻³	mol	3	Sn
2	30c	1.7x10 ⁻⁵	mol	2	Pt
2	30d	7.49x10 ⁻³	mol	3	Xe
2	40				many options for (a)-(c)... For (d): all noble gases + " <u><i>I Have No Bright Or Clever Friends</i></u> " (elements as diatomic molecules), except I ₂ & Br ₂ (volatile solid & liquid)
2	42a				berkelium
2	42b				bromine
2	42c				boron
2	42d				barium
2	42e				bismuth
2	46				copper ⁶⁵ Cu: 29p ⁺ , 36n, 29e ⁻
2	46				krypton ⁸⁶ Kr: 36p ⁺ , 50n, 36e ⁻
2	46				platinum ¹⁹⁵ Pt: 78p ⁺ , 117n, 78e ⁻
2	46				bromine ⁸¹ Br: 35p ⁺ , 46n, 35e ⁻
2	48				top: S N bottom: B I
2	54a				Zn zinc, Cd cadmium or Hg mercury
2	54b				18 possible answers...
2	54c				Pb, lead
2	54d				S, sulfur
2	54e				Na, sodium
2	54f				Xe, xenon
2	54g				Se, selenium
2	54h				Ge, germanium OR As, arsenic
2	56				carbon, oxygen, sulfur, phosphorus... – see section 2.6 for details.

Ch.	Q#	Answer	Units	SFs	Comments
2	62	1.6×10^{20}	atoms	2	iron...
2	68	140.	u	3	% abundance data limit SF, + apply sum rules; Element = cerium
2	74				need 2.96 cm^3 Na (use MM & density); cube edge 1.4 cm. 2SF due to density 0.97 g/cm^3 ; 1.44 cm edge if use 0.971 g/cm^3 .
2	76			2	volume of Cr in coating = 0.23 cm^3 ; 1.9×10^{22} atoms
2	79	1.0028×10^{23}	atoms	5	max mass of C on balance = 20001g, so used this mass...
2	80a	3.299×10^{22}	atoms	4	
2	80b				1 Pb atom = $1.819 \times 10^{-3} \text{ cm}^3$; Pb atom radius $1.631 \times 10^{-8} \text{ cm}$ Note: the 60% is not a <u>measurement</u> , so doesn't limit data.