**ELEMENTARY PRINCIPLES OF CHEMICAL PROCESSES**

**ERRATA – 4th EDITION TEXT**

**Updated 12-03-19**

**First printing:**

* **Front endsheet**:
* under “Selected Tables and Figures” and “Miscellaneous”, the page number for the Psychrometric chart (SI units) should be 433; and the page number for the Psychrometric chart (U.S. customary units) should be 434
* conversion factor table, under Pressure units: on the second line there should be “” before “dynes/cm2”
* conversion factor table, under Pressure units: on the fourth line, the factor should be “= 406.8 inches H2O (l) at 4oC”
* **p. vi:** The author-maintained website address (top of the second column) should be <http://epcp.wordpress.ncsu.edu>
* **p. 31:** Replace the text for problem 2.13, part (b), with the following: “Suppose you decide to install the 240W panels, and the average cost of electricity purchased over the next three years is $0.15/kWh. You can sell back "extra" electricity (the amount of electricity which the solar panels produce over and above your monthly requirement) to the utility for $0.15/kWh. What would the total cost "savings" be for the utility "sell back" over that 3-year period? What more would you need to know to determine whether the investment in the solar panels would pay off?”
* **p. 70:** In problem 3.13, part (a), insert the phrase “(assume it’s rectangular)” at the end of the first sentence.
* **p. 74:** In problem 3.30, the first line should have the word “Wet” inserted at the beginning; “Wet coal being used….” Below the weight % table, the first sentence should be replaced with, “The wet coal contains 4.58 lbm H2O per lbm of dry coal.”
* **p. 77:** In problem 3.37, the units in the table should be “Million Metric Tons C”, not “Metric Tons C”
* **p. 98:** in the italicized paragraph, line 1, change “kilograms” to “pounds”
* **p. 130:** in the second equation above the “Test Yourself” block, in the numerator of the third term, it should say “1 kmol O2 consumed” , not “1 kmol O3 consumed”
* **p. 133:** in both of the hydrogen balances at the bottom of the page (2 instances), it should read “300 mol H2/s”, not 300 mol N2/s
* **p. 141:** for the atomic C balance, the equation underneath the vertical arrow should read “200 kmol C/min = ”
* **p. 148**: In the O2 Balance, the general mass balance equation for O2 should say: "Output = Input - Consumption" instead of "Output = Generation - Consumption".

calculated,” with “Once again the same molar amounts have been calculated,”.

* **p. 149:** In the line under equation (2), the end of the sentence should read “…yields the following five extent of reaction balances [(3) – (7)] in five….”. Equation (5) should read 8*n*CO **(=** *nCO2) =* (1 mol CO2)2
* **p. 174:** In problem 4.5, part (a), line 2, the units of  should be (g C6H6/sec).
* **p. 179:** in problem 4.19, on the second line of part (a), replace the word “feed” with “aqueous serine solution”. The original wording of part (b) is correct: the second line should say “required feed rates of aqueous serine solution and methanol.”
* **p. 186:** In problem 4.36, in the list of data provided, *R*(SO2 analyzer) for the outlet gas should be 11.6, not 116.
* **p. 189:** in problem 4.43, part (c), the third line should say “65%” instead of “58%”.
* **p. 191:** in problem 4.46, second paragraph, line 6, it should say "20.0 kg" instead of "2.0 kg".
* **p. 192:** In problem 4.48, the second sentence should say"The feed ratio to the extractor is 3 kg hexane/kg beans".
* **p. 206:** in problem 4.80, replace part (a) with the following: “Assume a methanol production rate of 100 kmol/h. Perform the DOF for the overall system and all subsystems to prove that there is insufficient information to solve for all unknowns.”
* **p. 211:** in problem 4.90, change the CO2 mole% to 24.5% and the CO mole % to 6.10%.
* **p. 227:** in the degree of freedom analysis, third line, it should say “(overall, C3H6O)”
* **p. 230:** In the line under equation 5.3-2, the equation should be , not 
* **pp. 231-232:**
  + In the last bullet on p. 231, the equation numbers are off by one; Equation 5.3-3 should be 5.3-4; Equation 5.3-4 should be 5.3-5; and Equation 5.3-5 should be 5.3-6.
  + On the last line of p. 231, the value should be -0.112 instead of -0.113. On page 232, third line, the denominator should be (1.50 + 0.112) instead of (1.50 – 0.133).
* **p. 233:** for item 4 in the top 3rd of the page: replace “…5.3-11 for *T*r,…” with “5.3-12 for *T*r,…”
* **p. 249:** in the table below part (e), the units for gas evolved should be (mg CO2), not (g CO2)
* **p. 252:** in problem 5.40 on line 5, the mole% water should be 8.1 instead of 0.81.
* **p. 255:** in problem 5.48, at the end of the first sentence, add “at 25oC”.
* **p. 259:** in problem 5.59, the first bullet under data, it should say “mass%” instead of “mole%”
* **p. 260:** In problem 5.64, the formula for citric acid in the chemical reaction should be C6H8O7. Also, the mass amounts for citric acid and sodium bicarbonate are reversed in the problem statement; it should read “citric acid (1.000 x 103 mg) and sodium bicarbonate (1.916 x103 mg).”
* **p. 282:** the expressions for “*c”* above equation 6.2-1 should read “*c* = number of independent chemical species”
* **p. 289:** On the line that says “*p*H2O=(0.3)(289 mm Hg) = 86.7 mg Hg”, it should say “mm Hg”, instead of “mg Hg”.
* **p. 337**: problem 6.70(f): change *x*B value from 0.5 to 0.55
* **p. 338:** problem 6.71: in part (a), the denominator in the equation should read “*y – x*F” where F is subscripted
* **p. 374:** in Example 7.6-2, the pressure identified on the flowsheet for both the inlet and outlet streams should be “1 MPa”, not “5 bar”. Under the line , replace the text “Since the process materials are all gases and were are assuming ideal gas behavior,” with “Since the components have similar chemical structures and we can assume the mixture is ideal,”
* **p. 394:**in the stream data at the bottom of the page, the circled number 3 should have “Reflux” as the label, and the circled number 4 should have “Distillate” as the label.
* **p. 400:** in problem 7.62(a), replace the phrase “smooth (i.e. ignore friction)” with “frictionless”.
* **p. 418:** on line 2, it should say “can be read directly from Table B.8” (instead of Table B.9)
* **p. 427**: in the calculation of ΔH for path D, the units of  should be kJ/mol, not kJ./kg.
* **p. 429:** in Example 8.4-3:
  + part (a), in the calculation for Chen’s Equation, the last number in the denominator (Tc) should be 513.2, not 213.2
  + part (b), first line, it should say “Using the Watson’s correlation estimate:”
  + part (b): in both the first and second equations, the denominator of the ratio should be “513.2 – 337.9” (not “513.2 – 473”), and the ratio in parentheses (both equations) should be raised to the 0.38 power.
* **p. 460:** In problem 8.17, part (c), the last part of the sentence should say, “…than is calculated in Part (b).”
* **p. 469:** In part (a), first sentence, change “0.40 mJ/h” to “0.40 MJ/h”. In the second sentence, replace “If she is modeled as a closed adiabatic system at constant pressure” with “If she is modeled as a closed system at constant volume”.
* **p. 470:** In problem 8.59, the outlet conditions of the vapor and liquid streams should be 0oC and 3 atm. This should be corrected in the third line of the problem statement as well as both outlet streams in the flowsheet diagram.
* **p. 501**:
  + In section 9.3, underneath the first chemical reaction, replace 44.66 kJ/mol C6H6 with 48.66 kJ/mol C6H6
  + In the second paragraph, last 3 lines, -65.15 should be replaced by -365.15 (two instances)
* **p. 512:** In Footnote 7, last line, “1134” should be “1477”.
* **p. 535:** In problem 9.15, 3rd line, change “beween” to “between”
* **p. 541:** Under “Data for Diethyl Ether”, the last term in the relation for Cpshould be  instead of *T* 2.
* **p. 566:** The equation for a0 in part (c) of problem 9.81 has the upper limit of the sum missing in the last term. The upper limit should be 6.
* **pp. 628, 630, 632, 634:** In Table B.1 beginning on pp. 628, the carats should be removed from the headings of the last two columns (standard heats of formation and combustion), making those headings  and .
* **p. 630**, entries for formic acid:
  + Change the heat of vaporization from 22.25 to 46.3
  + Change the heat of formation of the liquid from -409.2 to -425.5
  + Change the heat of formation of the gas from -362.6 to -379.2
* **p. 631**:
  + Change the entry for the heat of combustion () for Methyl alcohol from 726.6 to -726.6.
  + Change the entry for the boiling point (*T*b) for mercury from -356.9 to 356.9.
* **p. 655:**the answers to the Test Yourself (TY) on p. 57 should be:

1.      68 x 10-6 kg creatinine/kg blood (or g/g or lbm/ lbm)

2.      68 mg creatinine

3.      0.0721 g creatinine/L blood (blood density = 1060 kg/m3)

* **p. 655:**
* TY on p. 134, Question 3: the last response should be 50 (delete “kmol”).
* TY on p. 140, Question 4: the response should be “80, 10” (delete “mol”)
* **p. 656:** 
  + TY for p. 150, Question 3: remove the “mol” unit from each extent of reaction answer , 3 instances.
  + TY for p. 240, Question 1: The expression for *T*r on p. 240 should be “*T*r = (-190 + 273.2)/(*T*c + 8)”.
  + TY for p. 241: Replace “Example 5.3-4” with “Example 5.4-2”.
* **p. 662:** 
  + The answer to problem 3.16 should be “**(c)** 0.63”
  + The answer to problem 3.30 should be 
  + The answer to problem 4.2 should be “4.1667 L/s”
  + The answer to problem 4.6 should be for (a) instead of (b)
* **p. 663:** 
  + The answer to problem 4.66 should be “**(e)** 0.795 mol A reacted/mol A fed”
  + The answer to problem 4.80 should be “No DOF = 0”
  + The answer to problem 4.82 should be 260.4 kmol C8H18/h.
  + The answer to problem 4.90 should be “**(a)** 49% excess O2”.
  + The answer to problem 4.96 should be “10.7% CO2”.
  + The answer to problem 5.40 should be “111.3 m3/h air”.
  + The answer to problem 5.50 should be “**(c)** 9.2105 angstroms”
  + The answer to problem 5.64 should be “1.46 L”
* **p. 664:** 
  + In the answer to problem 6.34, replace 1.56 with 1.98.
  + In the answer to problem 6.62, replace “C4H10” with “overhead vapor”
  + The answer to problem 6.70 should be “**(b)** *x*B = 0.323, *y*B = 0.615”
* **p. 665**:
  + The answer to problem 8.100 should be “**(b)** -471 kJ/L product”
  + The answer to problem 9.8 should be for **(c)** instead of **(b)**
  + The answer to problem 9.12 should be “**(c)** *Q* = - 0.34 kW”
  + The answer to problem 9.18 should be “**(b)** -0.812 kW”
  + The answer to problem 9.26 should be for **(b)** instead of **(c)**
  + The answer to problem 9.30 should be “**(a)** 862 kPa”
  + The answer to problem 9.32 should be “**(b)** 322.85oF”
  + The answer to problem 9.36 should be “**(b)** 1387.5 kJ”
  + The answer to problem 9.54 should be “**(d)** -70,459 kJ/h”
  + The answer to problem 9.60 should be “**(b)** 986 kJ transferred from reactor”