Corrections to "Physical Properties of Materials", August 2016

Corrections:

Page 28, 6 lines from end: composition of beryl is $Be_3Al_2SiO_6$.

Page 29, 3rd line of main text: composition of aquamarine is Fe^{3+} in $Be_3Al_2SiO_6$.

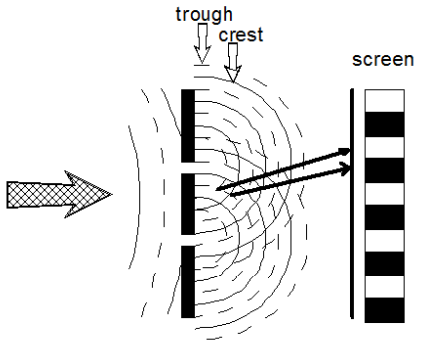
Page 48, Figure 3.3: The bonding orbitals of the polymer are π, not π*.

Page 52: The first text on the top of page 52 should read: "i.e., green, blue and violet..." (not "red and orange").

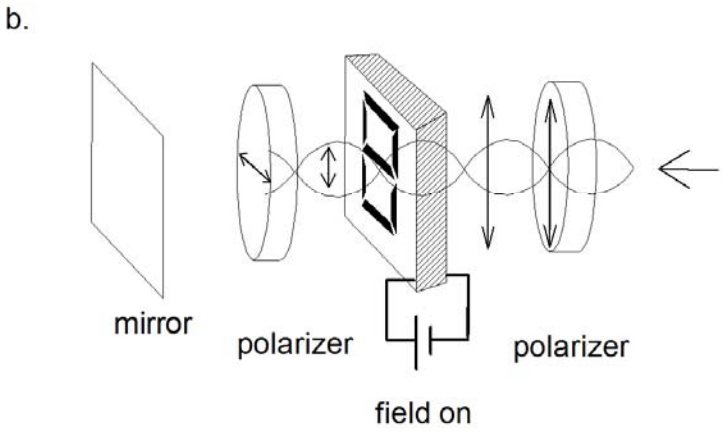
Page 52, line 2 of main text: Should read: "HgS is red."

Page 79, Figure 4.15: For both (a) and (b) the incoming beams should be exactly in phase (trough should align with trough, peak with peak; one wave is inadvertently slightly shifted).

Page 85, Figure 4.18: This figure is not quite correct in the textbook. The heavy arrows in the middle of the figure should be drawn as follows. The upper arrow should pass the intersection points of trough (upper wave) with trough (lower wave), and crest (upper wave) with crest (lower wave), giving constructive interference (light spot on screen). The lower arrow should pass the intersection points of trough (upper wave) with crest (lower wave), and crest (upper wave) with trough (lower wave), giving destructive interference (black spot on screen). A corrected figure is shown below.



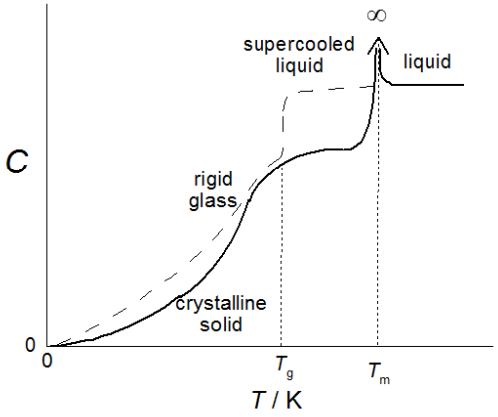
Page 104, Figure 5.4 (b) is incorrect and should be replaced with the following. (The difference is that the light signal should only get as far as the polarizer, and then stop there due to absorption.)



Page 133, Equation 6.18: The last term in the equation, $-P_R V_R$, should be $-P_R' V_R'$

Page 140: 2 lines from end: "election" should be "electron"

Page 144, Figure 6.12: This figure is not quite correct in the textbook. The heat capacity at low temperatures is not correctly drawn. A corrected figure is shown below.



Page 155, first line of text: "Equation 6.72" should be "Equation 6.73".

Page 229, line 5 of main text: change "of" to "or" ("A-A or B-B interactions").

Page 232, equation (9.24): Should read as follows (prime was missing from X_A in denominator):

$$\frac{n_{liq}}{n_{vap}} = \frac{Y_A - X'_A}{X'_A - X''_A} = \frac{ab}{bc}$$

Page 368, equation 13.9: Should be $T > T_C$ (not $T < T_C$).

Page 369, equation 13.10: Should be $T > T_N$ (not $T < T_N$).

Page 385, line 2 of text: should be $m^{1/2}$ not $m^{-1/2}$.

Page 431, footnote to Appendix 2 table: 80,6554 should be 806,544.

Clarifications:

Page 24, caption to Figure 2.6: At end of caption add " from, for example, fluorescence. Both emissions are narrower than the black-body emissions shown in Figure 2.7. However, atomic emissions, such as from Figure 2.5, would be narrower than those shown above."

Page 62, problem 3.8, line 3: After "traditional" insert "(CRT)".

Page 144, caption to Figure 6.11: Add "Si atoms are shown as small black circles, and O atoms are shown are larger grey circles. Note that this 2D presentation does not show the full bonding."

Page 152, line 6: It would be clearer if "at a second-order transition" was replaced with "at the temperature of the second-order transition, although *V*, *S* and *H* each have anomalous behaviour in the region of the transition".

Page 321, second paragraph of shaded Comment, second last line: Change "Figure 12.11" to "Figure 12.12".

Page 318, 3 lines from end of shaded Comment: Should read "conductivity to be inversely proportional".

Page 330, line 2 of main text: Change to read (new text is underlined): "either a p,n.p-junction or an n,p,n-junction. Since a p,n-junction allows current to flow only in one direction, a p,n,p-

junction does not allow much current to flow in either direction, unless some additional element removes or injects charge carriers into the middle. This middle element only need sot have a small current and it can control a large total current, and a transistor can act as either an amplifier or a switch."

Page 334, line 7 of main text: "Figure 12.28b" should be "Figure 12.27b".

Page 395, 5 lines from end: after "elastically," add "i.e. shows linear relationship between σ and ε,".

Minor Corrections/Additions:

Page 1, line 2: deleted second "to make"

Page 1, paragraph 4: ceramic**s**

Page 11, Figure 1.4: Atoms in top left corner for both monoclinic unit cells and the triclinic unit cell should be at the vertex (they incorrectly appear just inside the unit cell).

Page 40, Problem 2.17: "Stephan" should be "Stefan" (occurs twice).

Page 60, line 4 of section m: "materials" should be "material".

Page 70, caption to Figure 4.3, line 3: change "are the same" to "are nearly the same".

Page 86, paragraph 3, line 3: Change "nonliquid crystalline" to "ordinary".

Page 93, Problem 4.13, part (d): Change question to: "If change in the refractive index on entering the film was considered, draw the back-reflected light compared with the case described earlier."

Page 94, Problem 4.26: Change "the sky" to "the Earth's sky".

Page 116, Problem 5.13: Change "purple-red" to "violet-red" (occurs twice).

Page 117, Problem 5.17, part (b): Change "feasible" to "easy."

Page 134, footnote: F. Sherwood Rowland died in 2012.

Page 163, Problem 6.26, line 2: Change as follows (inserted text underlined; deleted text stroked out): that in many cases the heat capacity of a ~~substance~~ solid"

Page 163, Problem 6.26, line 7: After "both solids." add "The Neumann-Kopp Law can work well over a wide range of temperatures when M, X and M_2X_5 are all solids."

Page 180, middle of Comment: "stabilities of the order"

Page 180, change start of first full line of main text to: “For a uniform change in temperature of a material, the *thermal*...”

Page 217, second footnote: Sir Harold Kroto died in 2016.

Page 245, caption to Figure 9.44, line 4: “tzero” should be “zero”.

Page 256, Problem 9.24: change “blade” to “blades” (occurs twice).

Page 268, footnote: Heinrich Rohrer died in 2013.

Page 271, 2 lines after equation 10.3: change “constant” to “acceleration.”

Page 291, line 2 of main text: change “surfactant” to “amphiphilic”.

Page 321 line 3 of shaded Comment: delete “lead”

Page 347, problem 12.27, line 3: insert “individual” before “carbon nanotubes”