CH365 Chemical Engineering Thermodynamics

Lesson 20
Review

WPR 2

Lesson 21 – Tuesday 15 October

Coverage – Lessons 10-20 (Chapters 3 and 4) and Problem Sets 4, 5, 6, and 7

(1) Calculation of ideal ΔH, ΔU, W, and Q in a multi-step process. Sketching process path on PV axes.

(2) Real gases and cubic equations of state (RK, SRK, PR, virial)

(3) Correcting reaction enthalpy for temperature changes

a. Sensible Heat (direct integration of Cp, ICPH, MCPH)

b. Latent Heat / Heats of Reaction (IDCPH, MDCPH)

(4) Comparing CHEMCAD (to verify results of #2 and #3 above)

3 problems, (A-80, B-70, C-50 pts, 200 pts total), 55 minutes.

Make sure you have working Mathematica files for Problem 3.44 (c-e) 3.58 (c-f), 4.45, 4.55, and 4.83. Make sure you replicate approved solutions exactly or you have something wrong.

All WPR2 e-work to be uploaded to CANVAS (Mathematica)

Homework

Problem 4.6

If the heat capacity of a substance is correctly represented by an equation of the form

$$C_P = A + BT + CT^2,$$

show that the error resulting when $\langle C_P \rangle_H$ is assumed equal to C_P evaluated at the arithmetic mean of the initial and final temperatures is

$$C(T_2 - T_1)^2 / 12.$$