CH365 Chemical Engineering Thermodynamics

Lesson 20
Review

Professor Andrew Biaglow
7 October 2022

WPR 2

Lesson 21 – Wednesday 12 October

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

(1) Calculation of ΔH, ΔU, W, and Q in a multi-step process.

(2) Applications of cubic equations of state (RK, SRK, PR, virial)

(3) Correct enthalpy for temperature changes
   a. Sensible Heat (direct integration of Cp, ICPH, MCPH)
   b. Latent Heat / Heats of Reaction (IDCPH, MDCPH)

(4) Using CHEMCAD (to verify results)

3 problems, (80, 70, 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 files uploaded to SharePoint (Mathematica, CHEMCAD)

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

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