ChE 7023 **Homework Set 2** Due: February 4, 2019

All problems from Smith and Van Ness, 4th Ed.

4.1 What is the heat required when 10 mol of ethylene is heated from 200 to 1,100ºC at approximately atmospheric pressure in a steady-flow heat exchanger?

4.20 Determine the standard heat of the following reactions at 25ºC:
(a) $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$

4.21 What is the standard heat for the reaction of Prob. 4.20(a) at 550°C?

6.17 Steam at 3,000 (psia) and 1,000 (ºF) expands at constant enthalpy (as in a throttling process) to 2,000 (psia). What is the temperature of the steam in its final state and what is its entropy change? If steam were an ideal gas, what would be its final temperature and its entropy change?

6.47 Propane at 320K and 101.33 kPa is compressed isothermally to 1,603 kPa, its vapor pressure at 320K. Estimate ΔH and ΔS for the process using the generalized virial coefficient of Pitzer.