

Business



- Professional program application due April 15
- Handout: L3 exam booklet
- ChE Dept. Scholarship applications due June 15
 - Based on need, academic record, and service
 - Up to half tuition available
- Spring and Fall TA positions available (apply online through ChE web page)
 - Job opportunities → ChE part-time jobs

Business (cont.)

- Homework hints on web page for rest of semester
- Special Problem 11 is on the web page, but is to write a problem and solution for Exam 3
- Table of heat capacity coefficients on web page
 - <http://www.et.byu.edu/~tom/classes/273/273.html>



Last but not least...

- **Counting today**
 - 5 more class periods, including
 - 3 classes on Energy balances
 - 1 class on transient balances
 - Review for Exam 3... then Exam 3
 - Case Study (Ch. 14 problems)
 - Review for Final Exam
 - Final Exam



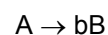
The End is Near!!

Goals Today

1. Energy Balance with ΔH_r^0 (single rxn)
2. Energy Balance with ΔH_r^0 (multiple rxns)



Board Problem



Caution on Enthalpy Tables

Find $\hat{h}_{\text{H}_2\text{O,liq}}$ at 25°C and 1 atm

1. Use steam tables (Table B.5)
(105.8 kJ/kg)(kg/1000 g)(18g/mol) = 188.6 kJ/mol
2. Use ΔH_f^0
Table B.1 says $\Delta H_f^0 = -285.84$ kJ/mol at 25°C and 1 atm

What about VdP term since reference for steam tables is at 0.0317 bar?

$$\begin{aligned} V_{\Delta P} &= (0.00101 \text{ m}^3/\text{kg})(1 \text{ atm} - .0317 \text{ bar}(\text{atm}/1.01325\text{bar}))(1.01325\text{e}5 \text{ N/m}^2/\text{atm}) \\ &= (99.1 \text{ N}\cdot\text{m}/\text{kg})(\text{kg}/1000 \text{ g})(18 \text{ g/mol})(\text{J}/\text{N}\cdot\text{m})(\text{kJ}/1000\text{J}) \\ &= 1.78\text{e-}3 \text{ kJ/mol} \end{aligned}$$

Look at Table B.7

- How Does \hat{h} change with pressure at 50°C?
 - 0.5 bar → 209.3 kJ/kg
 - 1.0 bar → 209.3 kJ/kg
 - 5.0 bar → 209.7 kJ/kg
- Pretty small change!!