

February 8, 2015

Dear EECE 503 students,

Here is my **weekly letter No. 5** reminding you to review, learn, arrange and summarize the material covered in class **during week 4 of lectures (February 3 and 5)**:

Compartmental models for gas – liquid systems (Ch. 8N). Learn how to do species mass balances for gas-liquid closed and open reaction systems. Learn the assumptions used in treating gas-liquid systems in the atmosphere, and how to deal with systems in which gas-liquid equilibrium is assumed to be present at all times for each species. Apply Ch. 8N to your exam 1 team problem (sulfur dioxide to acid rain).

Transport effects on reactions in the atmosphere (Ch9N). Learn how to estimate characteristic times for the following phenomena: i) gas phase diffusion to liquid droplets and establishment of steady state profile around the droplet, ii) equilibration of the gas-liquid interface as predicted by Henry's constant, iii) dissociation equilibration of gas species dissolved in the liquid, iv) diffusion in the liquid drop and establishing a uniform concentration, v) reaction in the liquid. Learn how to use these characteristic times in determining whether transport effects should be accounted for or a well mixed compartmental model can be used. Practice on the sulfur dioxide oxidation in clouds.

During the coming **Week 5.** (Feb. 10, 12) we will focus on:

Ideal Reactors: Batch, Continuous Flow Stirred Tank Reactor (CSTR), Plug Flow Reactor (PFR).

Evaluation of rate forms from ideal reactors.

Extension to simultaneous reaction and separation, systems with creation of another phase.

Non-ideal Flow Patterns: identification and quantification.