12/22/2017

Reactor Reflections

- Data Analysis
- On Drawing Conclusions
- The Story

Measurement Accuracy

- There is no advantage to measuring one parameter to 3 significant digits if another parameter is only measured to 1 significant digit
- Use appropriate significant digits

Mass Balance

- If the mass balance indicates an error then try to determine what caused the error
- What did you measure?
  - Tracer volume
  - Flow rate
  - pH
  - Reactor volume
- Which one of those measurements would explain the results you obtained?
- When discussing errors include your assessment of the culpability of each measured parameter or assumption

Errors in Residence Time

- What are the two methods you used to calculate the residence time?
- Why might the two estimates be different?

reason	$\theta = \frac{\forall}{Q}$? θ_{tracer}	because
Dead volume		
Baffling head loss		
Tracer addition, inlet, outlet		

Baffle Factor Calculations

- Given our curve fitting technique, how will you calculate the baffle factor?
- You could get a baffle factor based on when the model F curves pass through 0.1 or based on when the data F curve passes through 0.1
- The data curve baffle factor will vary as the tracer mass and residence time are varied by solver!
- In either case the baffle factor is only as good as the curve fit!

Serpentinity

- What parameter(s) were you adjusting when you created a more serpentine path?

$$E_{(t^*)} = \sqrt{\frac{Pe}{4\pi t^*}} \exp\left[\frac{-(1-t^*)^2 Pe}{4t^*}\right]$$

$$Pe = \frac{UL}{D_d}$$

Lab Reports as Stories

- When you write a report you are designing an experience for the reader
- The reader experiences it linearly (sequentially!)
- Prepare the reader
  - This is what you are going to see
    - Ex. emphasize what you want the reader to see in the next Figure
  - Show the figure (or equation)
  - Tell the meaning of what you just saw
  - How does this lead to the next step
  - The Story

Sequential Story and Logic Check

- Look at your Discussion Section
- Look at the overall order of the paragraphs
  - Read it as if you missed the last 3 weeks…
  - Is the order logical?
  - Is the reader missing information?
- Read every sentence
  - Check for logic
  - Make each sentence justify its existence

Critique Your Own Work!

- Don't make a conclusion unless you are willing to defend it
- Discuss its weaknesses and how you would improve it if given another chance
- Assess the validity of your data and of your conclusions
- Are you willing to spend a million dollars to build a facility using a design based on your results?

Suggestions and Comments

- The best ones focus on pedagogy (how could I improve the learning environment)
- What are requirements that don't produce much learning?
- How could requirements be changed to increase the learning?