

Graphical Representation—PFR with Conservative Tracer

CENG 340—Introduction to Environmental Engineering

Instructor: Deborah Sills

In Class: September 30, 2013

This handout will help you in lab and with your lab assignment.

Graph (in a qualitative manner) the effluent concentration (as a function of time) that you expect to observe coming out of (a) an ideal PFR (**now**), (b) a real PFR (**after class**), and (c) a CMFR (**after class**), as a result of a pulse input of a conservative tracer as depicted in Figure 1. Note that to draw the effluent concentration from a **CMFR**, you need to write a mass balance equation and follow the steps outlined in the handout titled, “Completely Mixed Flow Reactors; Steps for solving mass balance problems in CMFRs”—which was handed out last week on Wednesday, 25 September.

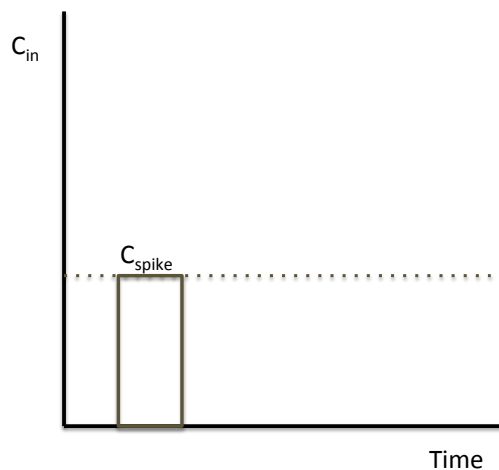


Figure 1: Influent concentration of a conservative tracer as a function of time.

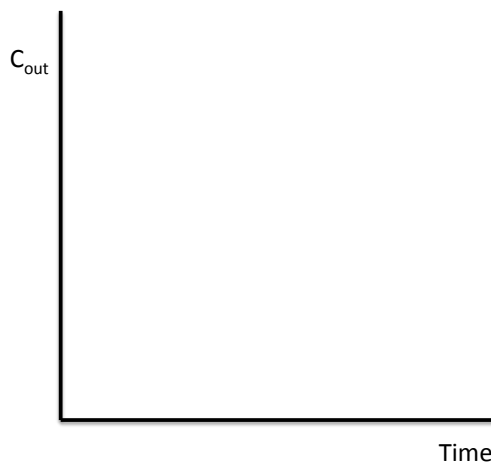


Figure 2: Effluent concentration of a conservative tracer from an ideal PFR as a function of time.

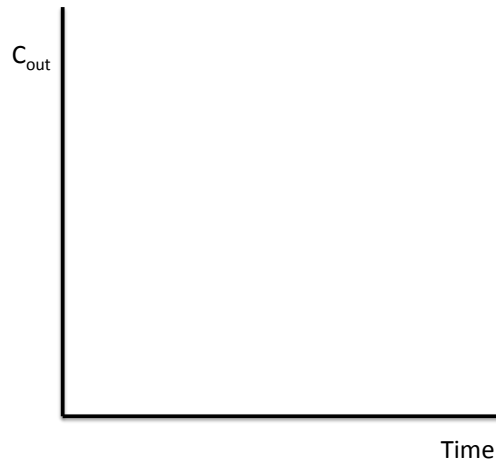


Figure 3: Effluent concentration of a conservative tracer from a real PFR as a function of time.

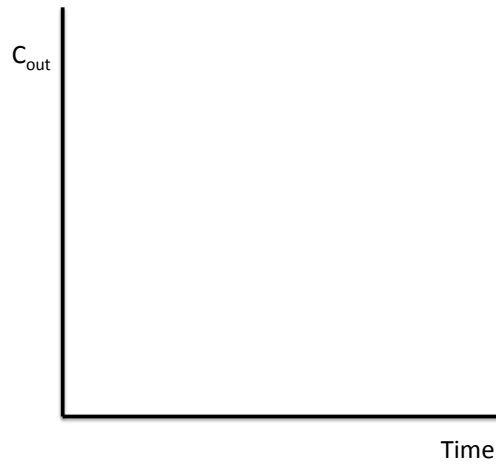


Figure 4: Effluent concentration of a conservative tracer from a CMFR as a function of time.