Date	
Name	
Legi-Nr.	

The following exercises should be solved in preparation to the experiment. Please send a copy of the exercises to the assistant via email at least the evening before the experiment.

1. Compare a continuous and discontinuous process.

2. Define the ideal and experimental mean residence time.

3. Explain with a drawing how to experimentally measure the residence time distribution of a tracer.

4. Explain why the tracer should have the following properties:

   - Similar flow properties as the main fluid

   - No interactions with the walls of the apparatuses

   - No reactions with other components

5. Compare the mixing properties of a CSTR and a PFR.

6. With the data that you can find on the script, calculate the theoretical mean residence time, τ, for the CSTR cascade as well as for the flow pipe experiments.

a)   CSTR cascade

Theoretical mean residence time $\tau = \dfrac{V_R}{\dot{V}}$

After the first CSTR .... s

After two CSTRs   .... s

After three CSTRs   .... s

b)   Flow pipe

Flow pipe volume $(V_R = \pi/4 \cdot d^2 \cdot L)$ L

Theoretical mean residence time   at   60 L/h   ....s

at 360 L/h   ....s