

Rapid Kinetic and Spectroscopy instruments

μ SFM20, SFM300&400 - precision of solution delivery (updated August 13, 2009)

These tests have been designed to illustrate the precision of micro-volumes delivery by the μ SFM-20 and/or SFM-300/400 instruments.

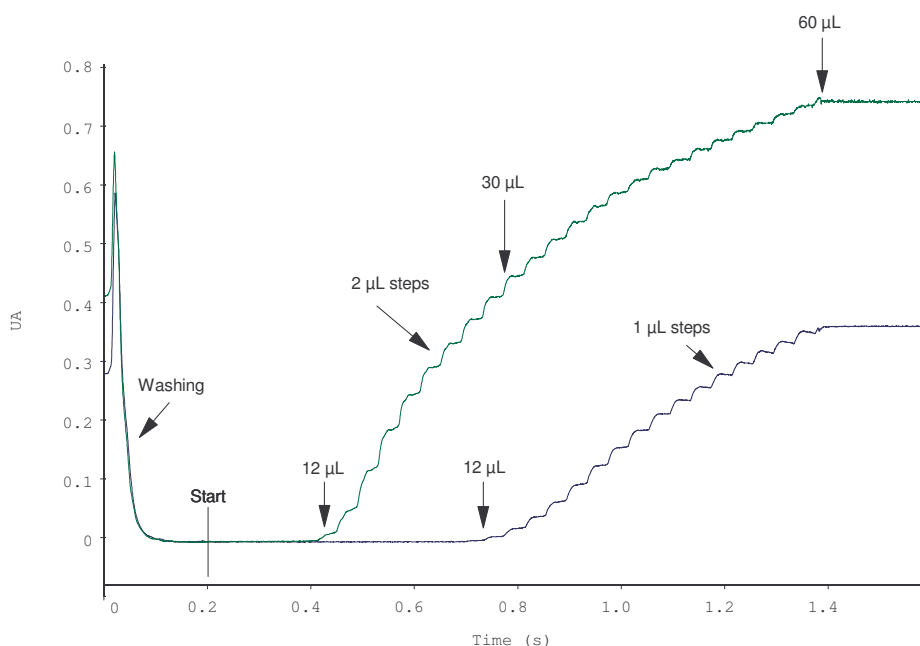
Description of the test :

- μ SFM-20 set with a TC-100/10 cuvette
- S1 = 10 mL filled with water
- S2 = 1 mL filled with Dichlorophenol Indophenol (DCIP) (OD = 0.9)

Sequence of shot :

- The cuvette is first washed with buffer by a 200 ms injection of 200 μ L water. This injection is made with S1 (S2 not active). This is followed by:
- Repetitive 1 or 2 μ L DCIP injections with S2 (S1 not active) (injection are made as 20 ms steps of either 1 or 2 μ L volume, separated by 20 ms pauses)

Absorbance of DCIP is measured as a function of time and is shown in the figure below :



Interpretation of the data :

The cuvette has an horizontal light path of 10 μ L (1x1x10 mm), entry of the light path is at 25 μ L from the center of the mixer, middle of the light path is at 30.2 μ L from the center of the mixer.

DCIP begins to enter in the light path at the 12 μ L injection step, this is exactly 1/2 the volume between mixer and entry of light path.

It is also observed that the concentration in the cuvette reaches 1/2 that contained in syringe S2 when the cuvette has been washed once. (30 μ L arrow). These values are in exact agreement with the theory (Poiseuille flow).