Lovis 2000ME Microviscometer & DMA 5000M Density Meter Short Protocol

Sample preparation:

1. Prepare 5 mL sample buffer for density and viscosity measurement. The optimal operating volume is 5 mL for XSample52 auto filling function.
2. For commonly used buffers and solutions, density and viscosity may be estimated using **Sedntrep.**

Start up:

1. Power up the instrument.
2. Select the measuring system: Ø1.59 and tap OK.
3. Log on user name: "bcf" at the upper right corner of the screen and tap OK.

Measurement:

1. It is advised to measure ddH_2O first to check the condition of the instrument.
2. Put the inlet tubings marked "Ethanol" and "ddH_2O" into the ethanol and ddH_2O 50mL-conical tubes from their storage tubes for automatic wash procedures. Please note that ethanol and water are chosen to clean and dry the system only for measurement of common biological buffers.
3. Put the sample inlet tubing into the ddH_2O (or sample) for ddH_2O (or sample) filling.
4. Change temperature to 20℃ by tapping Density Temperature and Lovis Temperature at the Quick settings menu.
5. Tap Start at the lower right corner of the screen to measure.
6. At the end of the measurement, rinse the sample inlet with buffer and water then replace the sample vial with a waste vessel and tap OK to start cleaning routine. The automatic cleaning process takes about 15 minutes.
7. If the density and viscosity of water are 0.998203±0.00001g/cm^3 and 1.003±0.005mPa-s at 20℃, you may start with your samples following steps 3-6.
8. At the end of all density and viscosity measurements, repeat steps 3-6 with ddH_2O to make sure the density and viscosity of water are 0.998203±0.00001g/cm^3 and 1.003±0.005mPa-s at 20℃. Otherwise, repeat measurements with automatic cleaning procedures.

Shut down:

1. Empty ddH_2O tube and waste.
2. Place Ethanol and ddH_2O inlet tubings into their storage tubes.
3. Place sample filling tubing into an empty and clean waste bottle.
4. Switch off the instrument.

Density of water: refer to DMA 5000M manual Appendix I.

Dynamic and Kinematic **Viscosity of Water** in SI Units (from engineering tool box):

Temperature *(^oC)*	Dynamic Viscosity *(Pa s, N s/m^2) x 10^{-3}*	Kinematic Viscosity *(m^2/s) x 10^{-6}*
0	1.787	1.787
5	1.519	1.519
10	1.307	1.307
20	1.002	1.004
30	0.798	0.801
40	0.653	0.658
50	0.547	0.553
60	0.467	0.475
70	0.404	0.413
80	0.355	0.365
90	0.315	0.326
100	0.282	0.29