

Standard Operating Procedure for Wyatt DynaPro Dynamic Light Scattering Instrument

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1. Have your samples ready in an aqueous buffer at approximately 1-10 mg/mL (i.e. for micelles 1mg/mL concentration in MOPS (3-(*N*-morpholino)propane sulfonic acid) buffer)
2. Take the plastic box with well plates, 1mL syringes, and either 0.2 or 0.45 μm (depending on what your sample expected size is) syringe filters (make sure they are hydrophilic syringe filters- i.e. PES) along with your sample to room 3##.
3. Don't forget lab's laptop or another computer with the DYNAMICS software.
4. Turn on the instrument as soon as you get into the room (it takes about 15 min for the laser to warm up). The switch is on the bottom right of the instrument *Fig 1*.

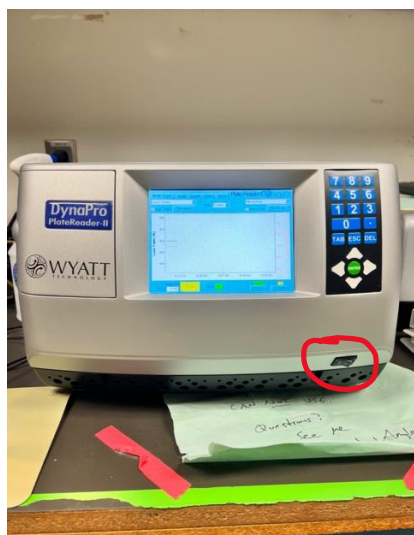


Fig 1 DLS instrument. Red circle is the switch to turn on the instrument.

5. After turning on the instrument, connect your laptop with the instrument by plugging the HDMI cord which is connected to the monitor there *Fig 2*.



Fig 2 Unplug yellow cord to connect your laptop with the instrument.

6. Open the application DYNAMICS V7.
7. Click on File → New → Connect!
8. On top left side, click on the plug sign (Fig 3) to connect your laptop with the instrument.

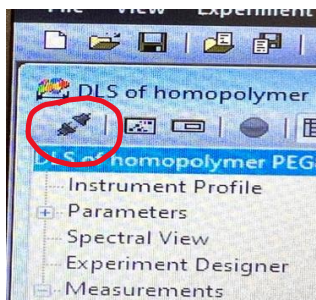


Fig 3 Red circle button is the connector between laptop and instrument.

9. Write the title of the experiment or your sample name. If have multiple samples to run, still put all of them in same title, always easier to run all of them together.
10. Click on Instrument Profile (Left side), change well count to 96 if not already set.
11. Then, go to Parameters → Instrument → Change DLS Acquisition Time to 10s and DLS Number Acquisition 10 (can do 5 and 5 for time sensitive data if less worried about data quality) (Fig 4)

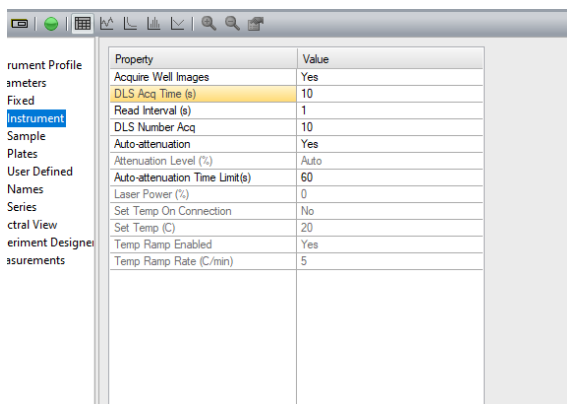


Fig 4 Acquisition time change window.

12. Click on Sample → New → MOPS
13. For viscosity choose PBS, it is similar to MOPS.
14. Click on Experiment Designer → Temperature → Select No for initial temperature lock → Choose the wells you will be putting your sample in (*Fig 5*).

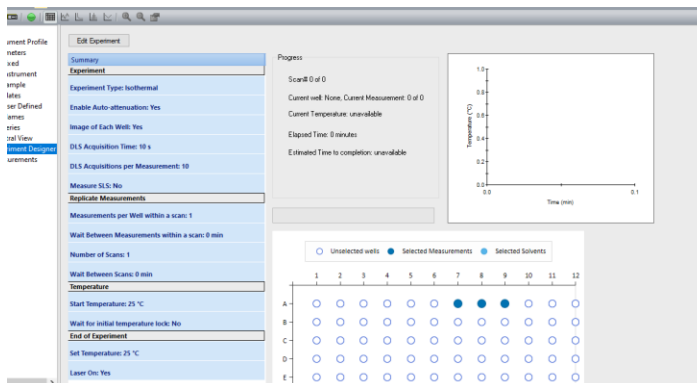


Fig 5 Experiment Designer Window

15. Go to properties, double check everything looks okay and all the changes you have made are registered.
16. Now, prepare your well plates with sample. Make sure to minimize dust (large particles will override the signal of your sample) getting into your samples by keeping them covered as much as possible.
17. Use syringe filters to fill your sample in the well plate to avoid any dust particles. Need around 100-200 microliters. If you are looking for intensity data (rather than size data) to compare to other samples, make sure the amount of sample is the same between samples.
18. Once done, open the door of the instrument (button is on the front side of instrument). Put the well plate and close the door.
19. Hit run in the application.
20. Under correlation graph (*Fig 6*), you can determine how close each fit (cumulants or regularization) is to the data to determine which fit is better to use.
21. The values given in the table (called datalog grid (*Fig 6*)) are from cumulants analysis meaning it is assuming there is a monomodal population. To add in dispersity data to this table, click on measurement, right click on the table and add %PD or PD index which will give the Polydispersity (note this value is different than SEC dispersity) of the sample.
22. If it is multimodal, the regularization graph fit (*Fig 6*) is likely best to understand the size of your sample.
23. After the run is done, take out the well plate from inside the instrument.
24. Disconnect the laptop from the instrument by taking out the yellow cord and connect it back to the monitor.
25. Switch off the instrument.



Fig 6 Data viewing buttons in top left. From left to right: grid: datalog grid, yellow line: datalog graph, red line: correlation graph, blue lines: regularization graph.