Zetasizer Start up/ Shut down Protocol Simplified



This protocol is for qualified users operating Zetasizer in IBC 402 only. Dr. Jao accepts no responsibility for actions taken as a result of using this protocol. Reading the manufacturer's software user guide is highly recommended.

Startup procedure

- 1. Turn on instrument and control PC. Give the laser at least 30 minutes to warm up.
- 2. Start Zetasizer Software and you will hear a series of 4 beeps.

Dynamic light scattering experiment

- 1. Choose File: New: Measurement File or click the new icon 🛅 in the tool bar.
- 2. Name your measurement file in C:\Document\Malvern Instrument\Measurement Data\Institute and select **save**.
- 3. Choose Measure: Manual to start a new measurement.
- 4. Choose size for the Measurement type in the left side Experiment tree.
- 5. Click **Sample** to name your sample.
- 6. Click **Sample: Material** and enter physical properties of your sample. Please note that the material RI is only needed to change the distribution from intensity-based to a volume- or number-based distribution. In the case of Rayleigh scatters, the RI can be ignored.
- Click Sample: Dispersant and click the icon is to select your solvent. If your solvent is not on the list, click Add to create a new dispersant. Enter the parameters of your solvent, including temperature, viscosity and refractive index. Dielectric constant is not used for DLS measurements.



Dispersants Manag	er			
Nane 40% Sucrose	Temperature (°C) Any Temperature Any Temperature	Viscosily (cP)	Refractive index	
Decane A Ethylone Glycol	25. Any Temperature	Name:		
Heptane R CN PBS Tablets	25. Any Temperature 26.			
Kerosene Methanol	25. Any Temperature	Temperature:	•	
Methyl Methacrylate Propan-2-ol	25. 25. Anu Temperature	Viscosty: 0.0000 🗘 cP	•	
A Tohana	AnuTemperature	Refractive Index:		
Modify	dd 👻 🚺		ancel Help	

- 8. Click **Sample: Temperature** to set up experimental temperature and equilibration time.
- 9. Click **Cell** to select cell type.



10. Click **Measurement**, choose **173**° **Backscatter** for measurement angle and select **Automatic** for the measurement duration. Alternatively, you can select **Manual** to fix the number of runs

and duration time.

11. Choose repeat **3 times** for your measurement.

Measurenet type: Ste hotunor configuration Sande Sande Caread options Caread opt	 Angle of detection Necesurement angle: 173° Backcoatter (NBS default) 	
	Measurement duration O Automatic Number of r O Manual 11	runs: Run duration (seconds)
	Hessurements Number of messurements Delay between mascurements (seconds) Delay between mascurements (seconds) Delay between mascurements (seconds) Delay between mascurements (seconds)	

- 12. Click **Measurement: Advanced** and select **Seek for optimum position (default)** for positioning method. You may fix the position if needed.
- 13. Click **Measurement: Advanced** and select **Yes** for Automatic attenuation selection. You may fix the attenuation level if needed.



- 14. No need to change the **Data processing** parameters.
- 15. Click **Ok** and the measurement window will be displayed.
- 16. Load your cuvette in the instrument.
- 17. Confirm the temperature is reached.



18. Click Start icon and start to measure.



Zeta potential experiment

- 1. Choose Zeta Potential for the Measurement type in the left side Experiment tree.
- 2. Click **Sample** and create your sample name.
- 3. Choose **Sample: Dispersant** and click the icon to select your solvent. if your solvent is not on the list, you can click **Add** to create a new dispersant.



Nane	Temperature (°C)	Viscosily (cP)	Refractive index	~
40% Sucrose	Any Temperature	192 C 198 G 1	- 400	
🜥 Acetone	Any Temperature	Dispersant Properti	es 🛛 🚩	
Decane	25.			
🜥 Ethylene Glycol	Any Temperature	Name:		
Heptane	25			
CN PBS Tablets	Any Temperature			1
Isopar P	25.	Temperature:		
Kerosene	25.			
🜥 Methanol	Any Temperature	C N	*	
Methyl Methacrylate	25.	Viscosity:		
Propan-2-ol	25.	0.0000		-
📥 THF	Any Temperature	0.0000		
🗥 Tolvene	Anii Tomnorshire	Refractive Index:		×
Modify	dd 🔹 🔽		ancel Help	Help

- Click Sample: General options to select Hunry's Function F(Ka).
 For polar buffer (dielectric constant >20), select Smoluchowski: 1.5.
 For non-polar buffer (dielectric constant <20), select Huckel: 1.0.
- 5. Click **Sample: Temperature** and set on your measurement temperature and equilibration time.
- 6. Click **Cell** and select your cell type.
- 7. Click **Measurement** and select Automatic for measurement duration. You can select **Manual** to fix the number of runs.
- 8. Choose repeat **3 times** for your measurement.



9. Click **Measurement: Advanced** to set on attenuation level and voltage application. Select **Yes** and the measurement will be automatically adjusted by software.



10. Click **Data processing** and select **auto mode** for analysis modal.

In **Auto mode**, the measurement will be automatically analyzed by General purpose or Monomodal analysis which depends on the conductivity of your sample.

In General purpose, you can obtain a distribution regardless of conductivity.

If conductivity is more than 10 mS/cm, it suggests use Monomodal analysis.

- 11. Select **Ok** and the measurement window will be displayed.
- 12. Load your cuvette in the instrument.
- 13. Confirm the temperature is reached.



14. Click Start icon and start to measure.



Sample loading tips for zeta potential measurement

- 1. Invert the cell.
- 2. Slowly inject the standard sample from its syringe into the cell and fill the U tube to just over half way.
- 3. Check no air bubbles in the cell. Tap the cell gently to dislodge any bubbles.
- 4. Turn the cell upright and continue injecting slowly until the electrodes are completely immersed.
- 5. Remove the syringe and insert a cell stopper in each port.

Shut down procedure

- 1. Close the software.
- 2. Please confirm that you save your data in your folder.
- 3. Turn off control PC and Zetasizer instrument.
- 4. File the log book.
- 5. Discard used disposable cuvette and take the wastes away with you.