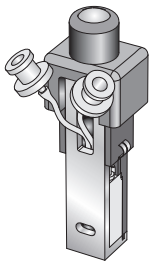
High Concentration Cell (ZEN1010)

This document gives a brief overview of the Zetasizer Nano High concentration cell. It primarily describes how to use, insert and clean the cell to ensure reliable and consistent measurements.

Description

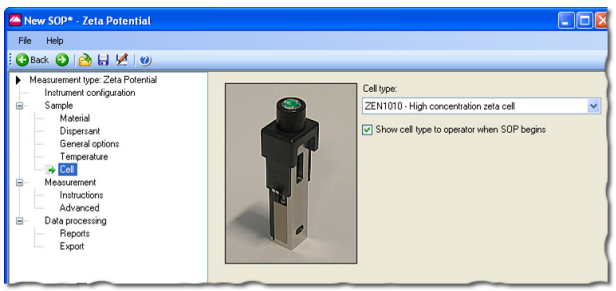


The High concentration cell is intended primarily for the measurement of zeta potential of concentrated aqueous samples. The cell can be used in conjunction with the MPT-2 for automated titrations.

The cell consists of a high precision optical measurement block held within electrode chambers. This is all contained in an outer cuvette sized casing assembly that allows excellent thermal contact with the instrument cuvette holder.

The cell is supplied with a kit of parts: 1/32" internal bore silicon tubing with appropriate Luer fittings, Luer plugs for manual filling and additional fittings for connection to the MPT-2 Autotitrator. Interdental brushes for cleaning of the electrode chamber, internal flow paths and optical block are also included.

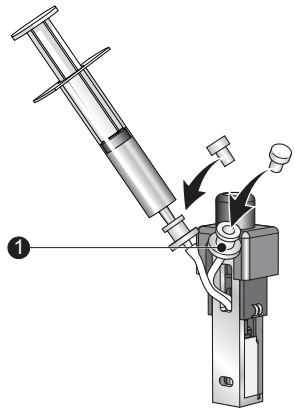
In the SOP



When using the High concentration cell select the cell in the relevent **Cell** SOP window.

The Zetasizer software will configure all settings and parameters to match the requested cell.

Filling the cell



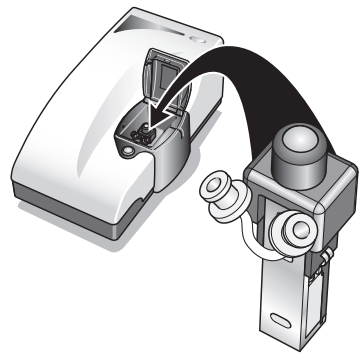
Filling the High concentration cell uses the same principle as the Folded capillary cell; refer to the Zetasizer Nano user manual for details. Specific details for the High concentration cell are indicated below.

Inject the sample **slowly** until the liquid reaches the bottom of the 'luer' outlet ①.

Check no air bubbles form in the cell. Tap the cell gently to dislodge any that do form.

Remove the syringe and insert a cell stopper in **each** port. Remove any liquid spilt on the electrodes.

Inserting the Cell



The High concentration cell is inserted into the instrument and connected to the titrator in the same manner as the Folded capillary cell; refer to the Zetasizer Nano user manual for details. Specific details for the High concentration cell are indicated below

The metal face of the cell must face the front of the instrument, to ensure good thermal contact between cell and instrument.

Cleaning the High concentration cell

General cleaning

Rinsing of the cell **prior** to a measurement should be carried out by flushing through with copious amounts of de-ionised water. External surfaces of the assembled cell can be wiped clean with a weak soap solution.

Intensive cleaning.

The cell first has to be disassembled before cleaning can be performed

Remove the screw cap ①.

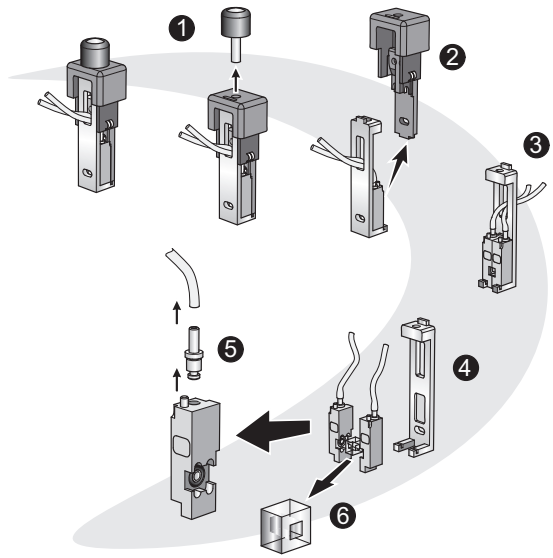
Separate the two halves of the cell ② by pulling the rear casing vertically away from the metal front.

Note how the Electrode chambers and quartz measurement cell block are assembled ③.

Remove the chambers and cell block from the metal front casing ④.

Detach the pipework and remove the top port ⑤ .

Protect the cell block from damage ⑥.



Once the cell has been disassembled, cleaning can be performed as described in the following table. The material and chemical compatibility of each component is detailed in the next section.

Component	Cleaning method
Screw cap	Wipe clean with a mild soap solution
Outer casing	Black part of casing (Rear - Delrin): Wipe clean with a mild soap solution Metal part of casing (Front - Stainless steel): Immerse the casing in Hellmanex and place in a gentle ultrasound bath (30 Watts) for five to 15 minutes. Rinse with water once cleaned.
Electrode chambers and port	Electrode Chamber: Scrub gently with interdental brush and Hellmanex, then scrub with copious amounts of de-ionised water. Smaller internal bore: Scrub gently with interdental brush and Hellmanex, then scrub with copious amounts of de-ionised water.

Component	Cleaning method
Quartz measurement cell block	Scrub both internally and externally with interdental brush. Afterwards brush with copious amounts of water. **Note**: Once inserted back into assembly, a cotton bud with ethanol can be used for light cleaning of the outside of the cell block. This is only to remove any errant marks that may have occurred when assembling the cell.

Once cleaned, leave all parts to dry before re-assembling. Re-assembly is the reverse of dis-assembly. Take care not to damage the sprung electrodes located in the rear casing.

Chemical compatibility

Components of the Zetasizer Nano that may come into contact with the sample are manufactured from materials that are considered to give the widest protection from chemical attack. However, it is important to check that any sample or titrant used is chemically compatible with the materials mentioned.

Warning!
It is advisable that the chemical compatibility is checked against the materials identified below before inserting a sample. It is also recommended that a test is performed on the material with the sample before more permanent usage is undertaken.

With proper use, only the central electrode and measurement section of the High concentration cell will ever come in contact with sample. The outer components of the cell will only come into contact if spillage or overfilling occurs.

Component	Materials
Central section	
Electrode chambers / O-rings	Natural PEEK / Nitrile rubber
Electrodes	Palladium
Electrode contacts	Brass
Precision measurement block	Quartz
Tubing	Silicone rubber
Outer components	
Casing	Delrin / Stainless steel 316
Cap	Delrin / Phosphor Bronze
Contacts	Gold plated beryllium / Copper