

## Optical Rotation – Specific Rotation Measurement Procedures – Rudolph Research Polarimeter

### Source Video: Polarimeter Measurement Procedures to Determine Optical Rotation / Specific Rotation Video Transcript from the Rudolph Research Video Library

This video covers how to fill cells and make a (Optical Rotation and Specific Rotation) measurements using a Rudolph polarimeter equipped with the exclusive and patented Temptrol heating and cooling system. Although this demonstration was made using an Autopol V Plus the procedure is similar for all models equipped with Temptrol.

Note: This video covers manual cell filling using a syringe and manual cell washing. For the procedure with the Easy Clean equipped Autopol see the separate video. Before making the measurement I have prepared the following 2 x 3 ml syringes, a 40T-5-100-2.0 cell, the blank, and the sample to be measured.

**Note:** Procedure is the same for all 40T cells

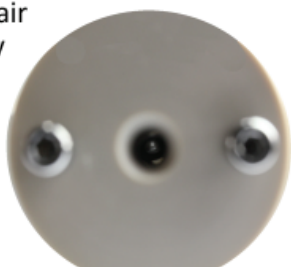
**Note:** For details of sample preparation see monograph in appropriate Pharmacopeia Monograph for Optical Rotation and Specific Rotation.

With the Polarimeter the first step is to select the method, select the method and press set. In this case I am using Sucrose and have selected the Sucrose Method

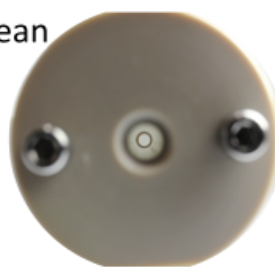
**Note:** For details on making a method, see separate video.

First check that the cell is empty and dry. The easiest way to do this is look down the cell, hold it up to the light, and look along the bore.

Cell with air  
or not dry



Cell is clean  
and dry



### Filling the Polarimeter Sample Cell

Fill the syringe with the blank. In this case, for the video, I am using Sucrose and Water which obviously is not harmful but in a real life laboratory environment it would be preferable to wear gloves while doing this.

Air bubbles are your enemy in this situation so I will remove the air bubbles before I put the sample into the cell.

I hold the cell in one hand and the syringe in the other and make sure the top of the cell is pointing toward the ceiling and place the syringe into the lure tip at the lowest end of the sample cell.

I will now slowly inject the sample (Water blank) into the cell while looking at the end and when I see the sample appear at the other end I will place a cap on the cell, place a cap on the other end of the cell, and now we are ready for measurement.

**Note:** The cell is symmetrical; it can be filled from either end

### Blanking the Polarimeter

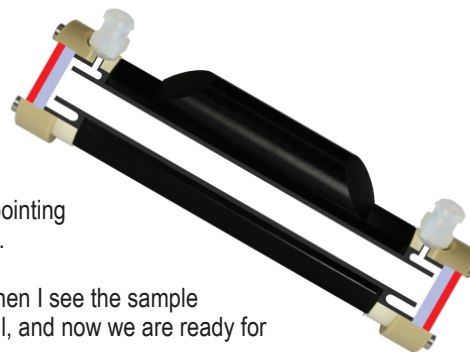
Now that I have filled the cell, I will place it inside the instrument. I will place it in the trough and move it to the right hand side. When placing the cell inside the trough insure the back part of the sample cell mates correctly with the Temptrol section at the back of the (Polarimeter) trough. This is important as this is section where the heat is transferred across. Insure that the cell is not canted like so or so (Forward or backward)

Place the temperature sensor in the cell. The temperature sensor wire goes in the small hole at the back of the cell. Close the door, and we are now ready to blank the instrument.

Now that we have completed blanking the instrument, put the temperature probe back in the holder and we empty the cell, after emptying the cell, we will reload with sample, perhaps 2 or 3 flushes with sample so it is not diluted by the blank,

**Note:** Remove the Polarimeter Sample Cell and clean – For more details on cell cleaning see additional video – Polarimeter Sample Cell Cleaning Procedures

**Note:** Refill the cell with the sample to be measured



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### **Taking an Optical Rotation Measurement**

We will now place the cell back into the chamber, place temperature sensor back inside the cell, slide cell to the end, and push the start button. The instrument is now going to ask me for the concentration, I will key in the concentration that I have made the sample to, press set. The system now will bring the sample to the required temperature, for sucrose this is 20 C for other materials it may be 25 C or even at different temperature. When the sample is stable at the required temperature it will measure, it will measure the optical rotation and display this under the live reading; it will then calculate the specific rotation using the formula within the USP and display on the main screen. In this case we are just looking at the screen, we could also have the instrument connected to a network and it would save automatically to the network, or we could have it connected to a printer and the result would print automatically. (End – Optical Rotation Measurement)

### **Additional Information about Polarimetry**

Additional information about Polarimetry and understanding Optical Rotation and Specific Rotation measurements.

### **Additional Information about Polarimeters**

To view the entire line of Rudolph Research Polarimeters please visit Rudolph Research Analytical or view our Autopol line of Automatic Polarimeters