**Perkin Elmer TMA 7**

2/12/13

**Operating Procedures**

**(Temperature Range: 20oC-900oC)**

The Perkin Elmer TMA 7 measures the changes in dimension and visco-elasticity as a function of temperature or time. It has multiple quartz probe types: expansion, compression, flexure, extension, and dilatometer.



* **Please sign into the logbook located on the table between the TGA and the DSC on the North wall of the lab.** Write down the date, your name, the instrument used, what sample is to be run, and the temperature program (range and heating rate). Also indicate how many runs are performed and any problems that occur during use.
* **Using the Perkin Elmer TMA 7.**

1. Open the valve on the Helium gas cylinder (lefty loosy) located on the North wall of the room.
   1. The pressure should read 35 psi for the Helium
2. The Helium will also need to be checked on the West wall behind the TMA instruments.
   1. Here the gauge connected to the TMA should read 30 psi
3. The TMA instruments can also connect to a water cooling system. The valves for the water are next to the helium gauge on the West wall behind the TMA instruments. Turn the water on by turning the green handles perpendicular to the wall.
4. Log onto the TMA computer using your ISU NetID.
5. The Launchpad billing software will open upon login. To use this software:
   1. Click the Login button that appears
   2. The first time you use the software you will get another window asking if you are using an ISU NetID or an external account. Leave it on the default of ISU NetID then click Continue.
   3. Enter your username and password; it will verify.
   4. Enter your account, supervising professor, sample description, experiment description, and hit next.
      * Note the account number will auto format so just enter the numbers and it will enter the dashes for you
   5. The software will then show you a “Pyris” button, click this to launch the software
6. With Pyris Manager open, you will need to select which TMA instrument you will use (#1 on the left or #2 on the right) in order for the software to make a connection with the instrument.
7. Once the connection has been made, the rest of the software will open, and the “Method Editor” window will appear.
   1. On the “Sample Info” tab, enter the name of your sample, the operator’s name, and any comments about your sample.
   2. Place the cursor in the “File Name” box and click on “Browse” to find the folder in which you would like to save your data, and give the experiment that will be performed a file name. Click on save.
   3. In the area labeled “Enter Sample Dimensions” the dimensions of your sample will be entered automatically later, but you will need to select “Expansion-disc” in the drop down menu for “Measuring System/Geometry”.
   4. Next, on the “Initial State” tab, in the section labeled “Set Initial Values” enter the temperature you would like your experiment to start at.
   5. Move to the “Program” tab of the “Method Editor” window and click on the “Add a Step” button to add temperature scans and isothermals, or to repeat steps. Below the program window, there will be options to edit the selected step by changing the temperature range and scan rate of thermal scans, or the temperature and duration of isotherms.
   6. Make sure to save your method by going to “File🡪 Save Method as”, give your method an appropriate name and save it in the “Methods” folder.

* **Starting an experiment.**

1. Make sure that the “Start/Stop” button looks like TMA Start-Stop button, if it does not then the software is not communicating with the instrument. Click it once to allow the communication to happen.
2. On the TMA instrument, push the black button on the right-hand side in (to the left) and lower the furnace.
3. Make sure that there is not a sample in the assembly or remove the yellow sponge, and push the down button on the front of the instrument. Then on the software push the “Apply Force” button TMA Apply Current Forces, then the “Read Zero” button TMA Read Zero Height. This will zero the height of the probe.
4. On the front of the instrument, push the up button. Once the probe is high enough, press the hold button and place your sample in the assembly using a pair of tweezers. Center the sample and press the down button. Raise the furnace by pushing in the black button on the right-hand side and moving the furnace up until it locks into place.
5. Back on the computer, enter the starting temperature for your experiment in the “Temperature” box, then hit the “Go to Temperature” button above it .
6. When the temperature has stabilized at the starting temperature in “Sample Temp” box in the upper left corner, push the “Read Sample Height” button TMA Sample Height.
7. The height will be read and saved in the “Height” box on the “Sample Info” tab of the “Method Editor” Window.
8. Then, to start the experiment click the “Start/Stop” button TMA Start-Stop button, and wait for the run to complete.
9. When the experiment is done, the temperature will go back to the initial value automatically.
10. Lower the furnace, remove your sample, place the yellow sponge back in the assembly and press the down button on the front of the instrument.

* **After the experiment.**

1. If you are the last to use the TMA, turn off all gas cylinders and the water.
2. Close the Pyris software, select “End Session” on the Launchpad software.