

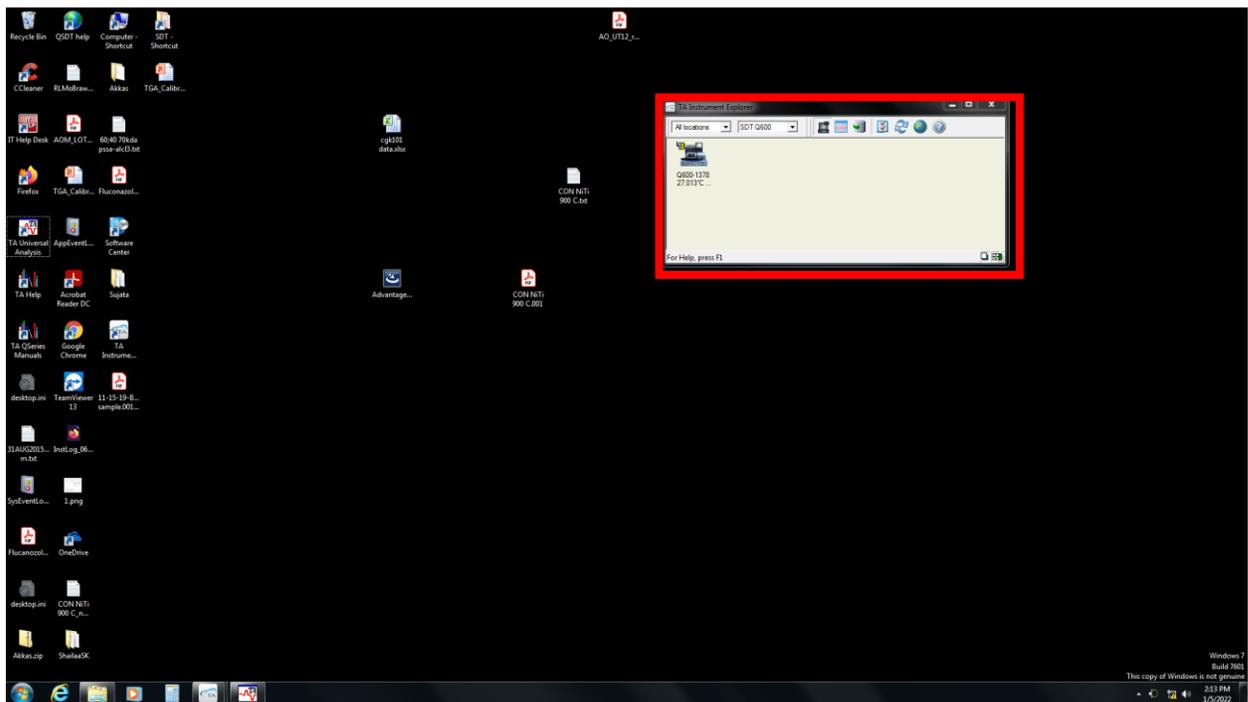
## TGA using Q600 instrument

### Experimental Considerations

- 1) Before starting the instrument consider your experiment conditions:
  - a. What temperature range are you testing?
    - i. Up to 400 °C you can use disposable Al pans
    - ii. Max temperature between 400 °C and 1000 °C use Pt pans
    - iii. Max temperature above 1000 °C use alumina (white ceramic) pans
  - b. Do you want to test in the presence of O<sub>2</sub> (use air) or not (use N<sub>2</sub> gas)
  - c. Will your sample react with the sample pan at the desired temperatures?
  - d. How will your sample break down under heating? Will it decompose to create noxious/poisonous gases? If yes **Stop here!**
    - i. If you aren't sure **stop** and **look it up** in the literature. By products are vented into the room

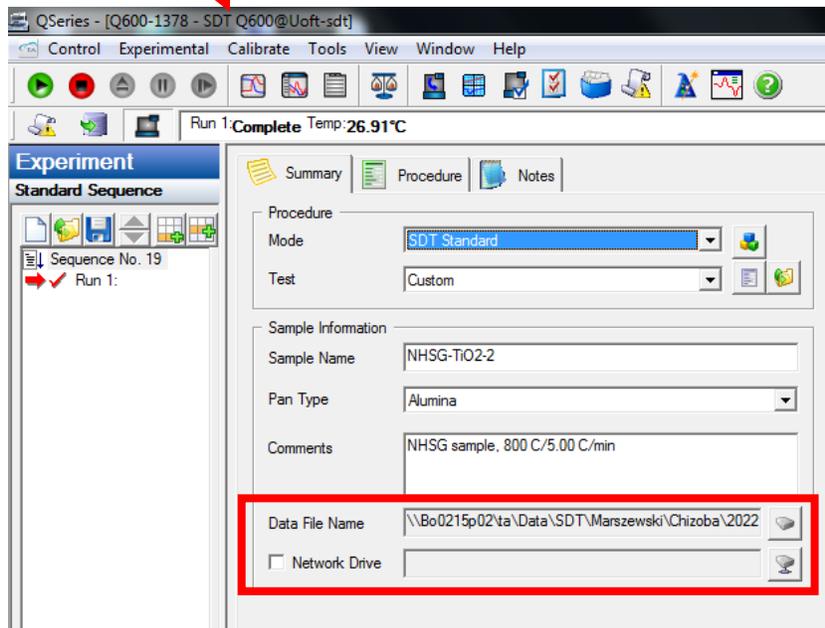
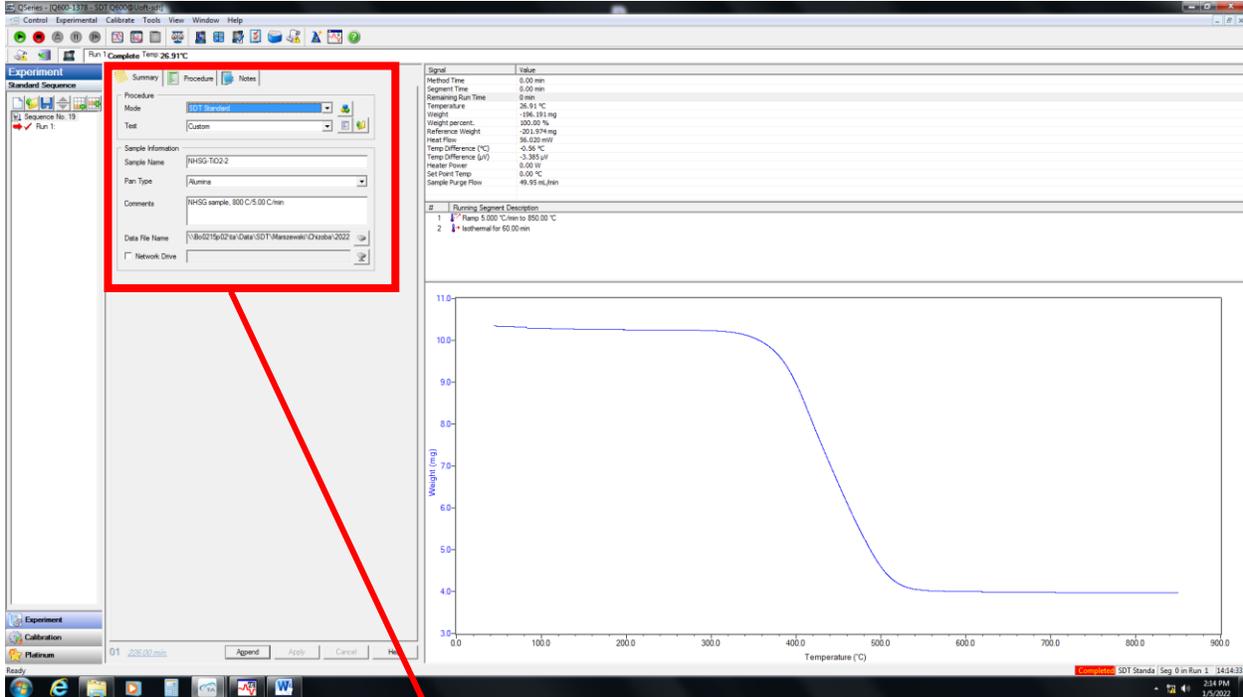
### Computer Program Setup

- 1) Open the gas tank you intend to use for your experiment
- 2) On the instrument computer open the instrument control program by clicking on the instrument icon outlined in red in the image below

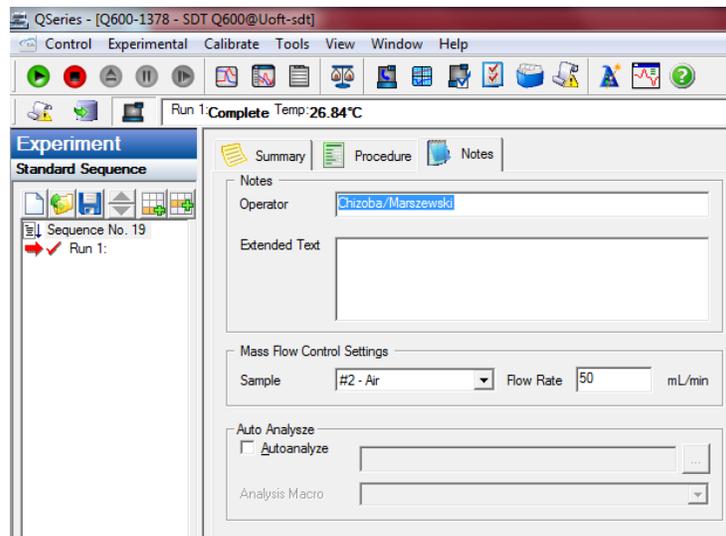
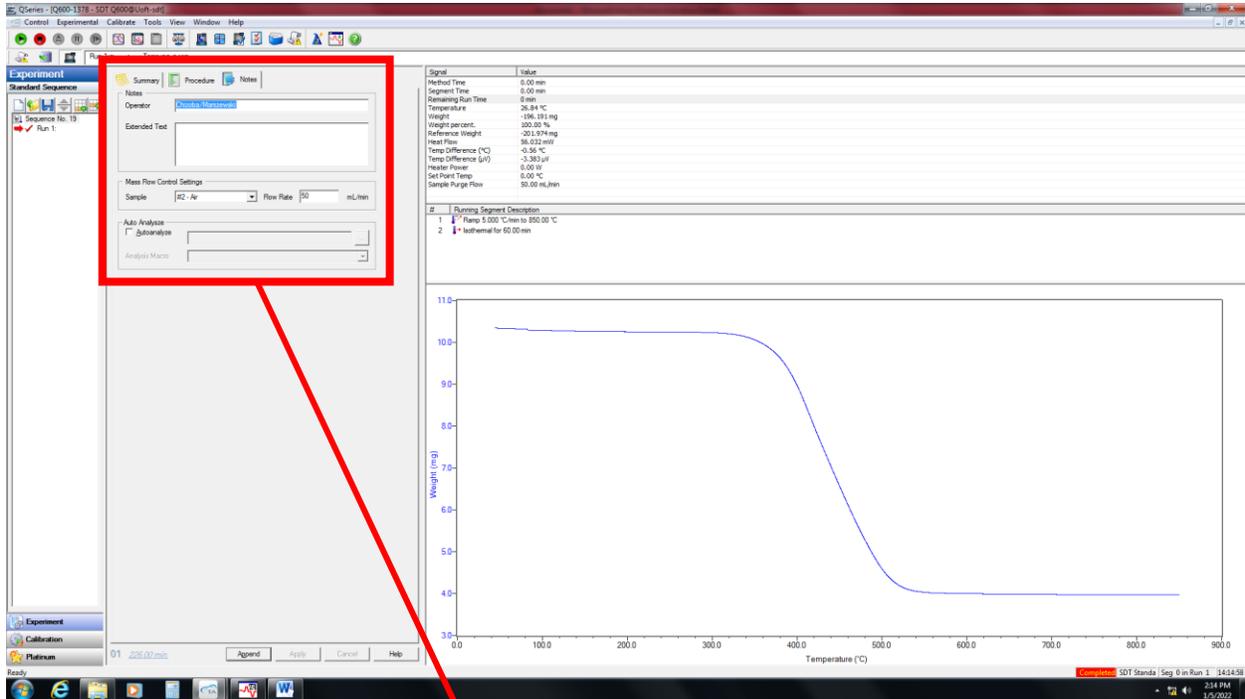


- 3) Go to the Summary Tab
  - a. Under **Mode** select **SDT Standard**
  - b. Under **Test** select **Custom**
  - c. Under **Sample Information** fill in the sample name, select the pan type and add any comments in the comments section

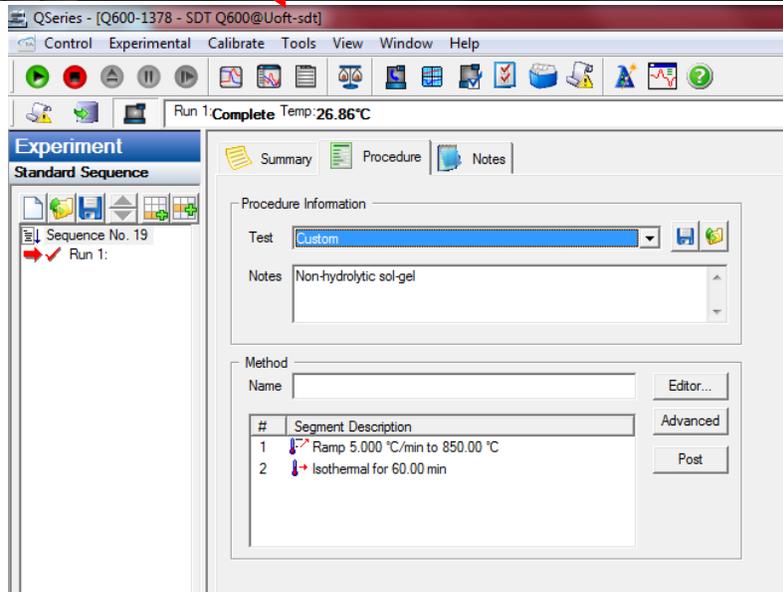
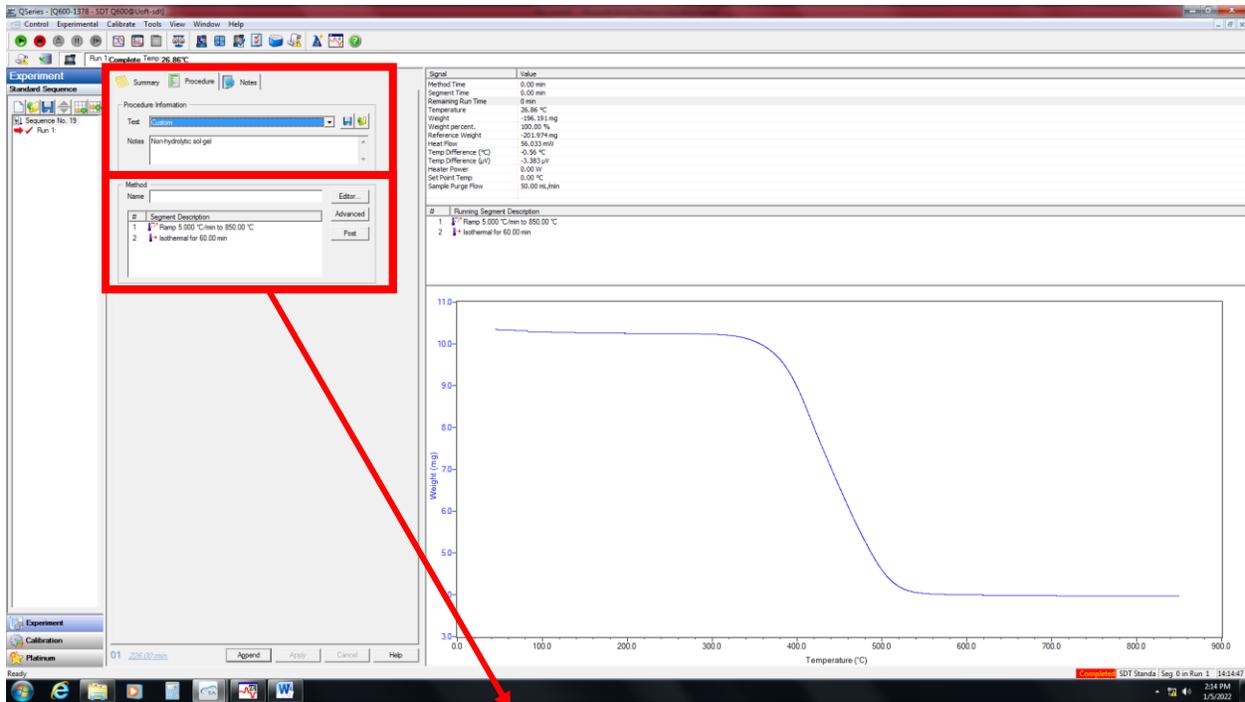
- d. Next to **Data File Name** click on the button with the box on it to open the file save menu
- e. In this menu select the folder you want to save in and fill in the file name then click save



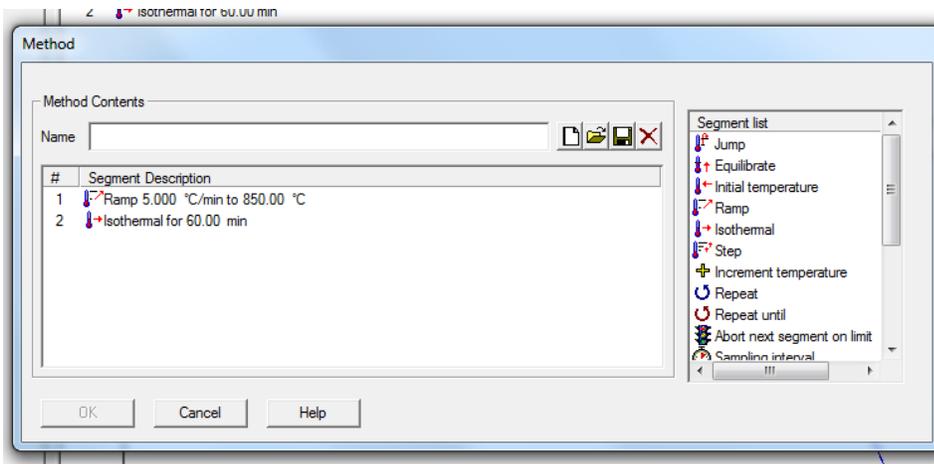
- 4) Go to the Notes tab
  - a. In the operator field type in your name
  - b. In the purge gas section select the gas you will be using (N<sub>2</sub> or air)
  - c. The Flow rate should be kept at 50 mL/min



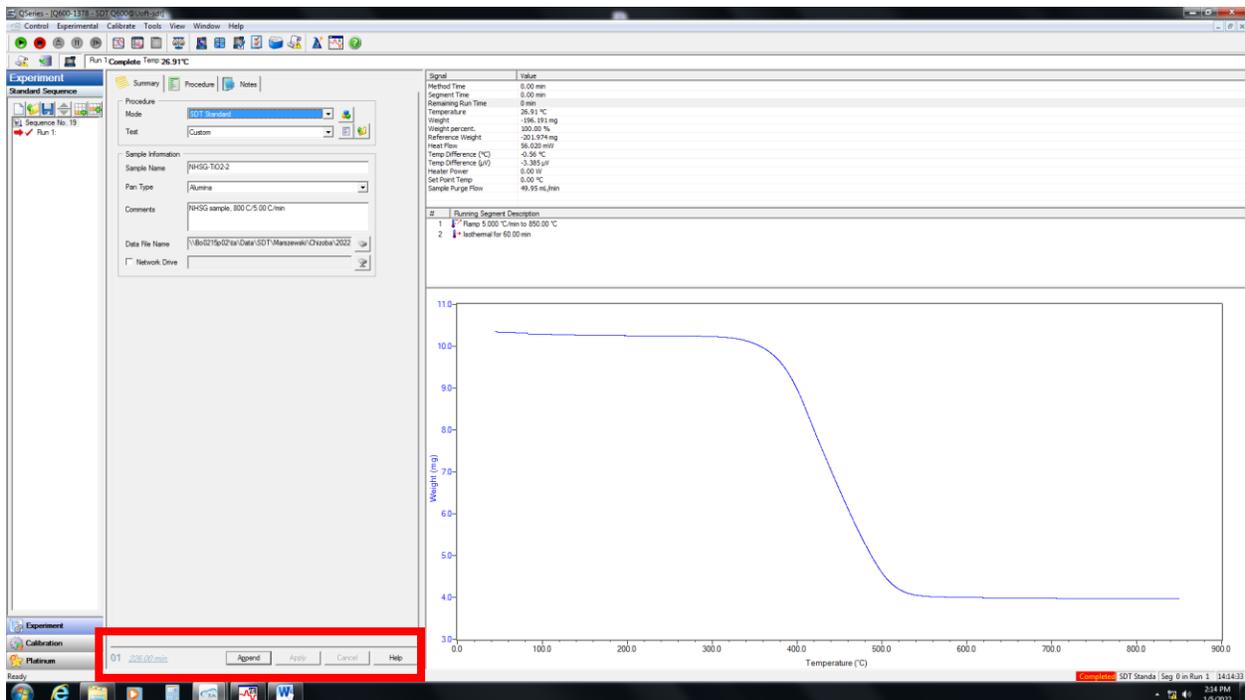
- 5) Go to the Procedure tab
  - a. In the drop down next to **Test** select **Custom**
  - b. In the notes section you can fill in any information about your test that you would like to have
  - c. Under **Method** click on the **Editor** button to change the method



d. This will open the method editor window shown below

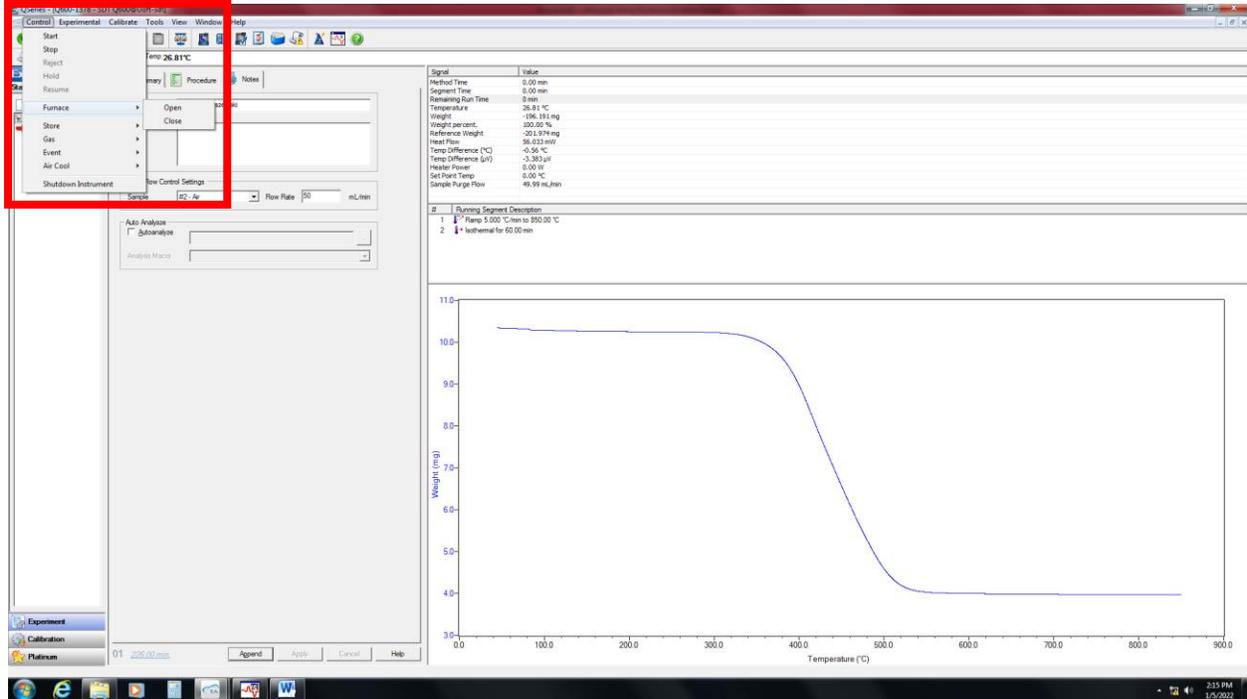


- e. Click on the **New Method** button (White sheet icon) to start a new method
  - f. Click on and drag the segment types you want to use in your experiment into the white box on the left
  - g. Most common segments used are:
    - i. **Ramp**: Changes furnace temperature at a given rate in °C/min up to a specified temperature
    - ii. **Isothermal**: Holds furnace at last set temperature for a specified amount of time in minutes
- 6) Once you have confirmed that all method and data file information has been properly input click on **Apply** in the bottom left side of the screen

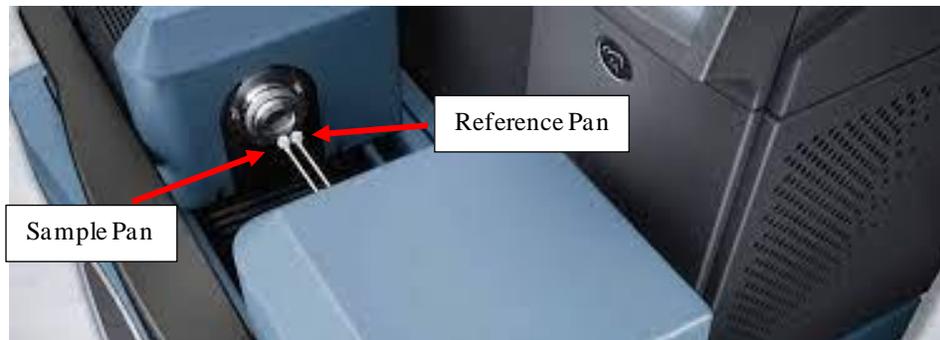


## Loading sample and starting run

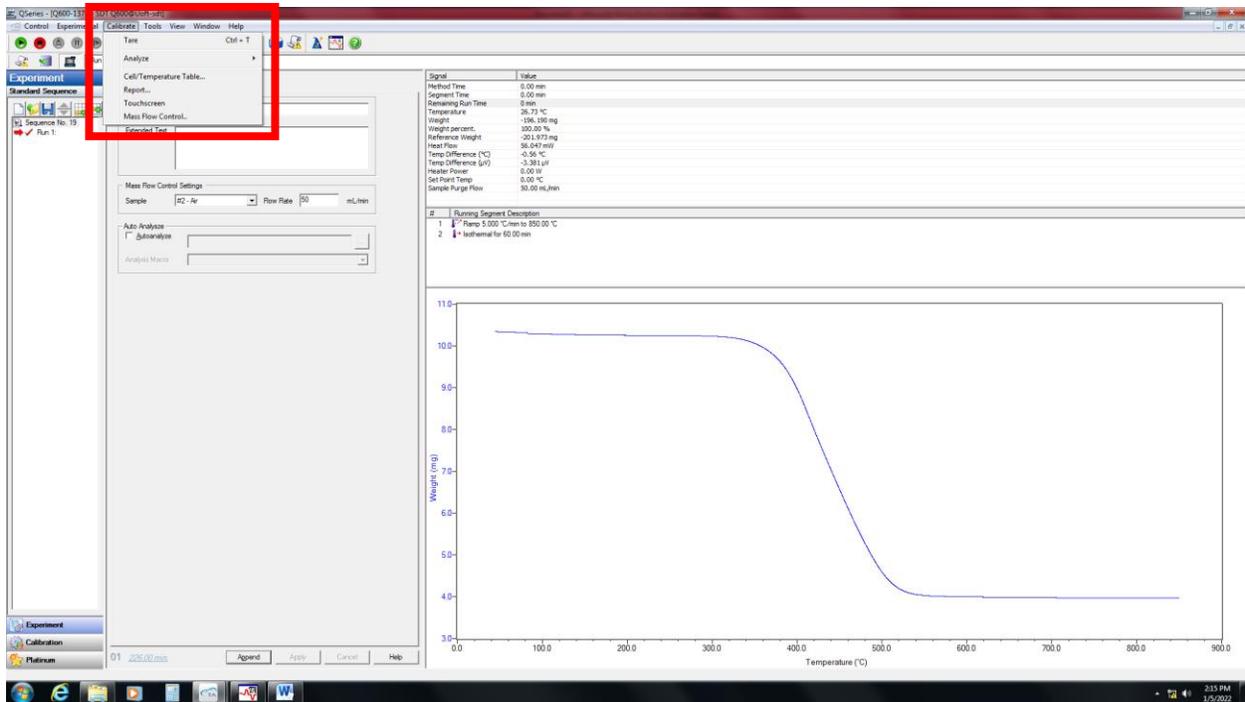
- 1) On the computer program click **Control**
  - a. In the drop-down menu select **Furnace** then click **Open**
  - b. To close the furnace click **Close**



- 2) Wait for the instrument furnace to completely open
- 3) Carefully place empty sample pan and reference pans on the sample arms
  - a. Orientation is shown in image below



- b. **Be careful!** These arms are very fragile and can easily snap if improperly handled, get help from Jennifer if you aren't feeling confident.
- 4) Close the furnace as described in step 1 above
- 5) With the furnace closed click on **Calibrate** then click on **Tare**



- 6) Open the furnace to access the sample pan
- 7) Remove the sample pan from the TGA arm and load it with your sample
  - a. Make sure that your sample lays flat on the pan bottom
  - b. Sample mass used depends on sample type and what data you are interested in but anywhere between 5 mg and 50 mg will usually work
- 8) Place the sample pan with sample back on the TGA arm carefully
- 9) Close the furnace

Sample is now loaded and ready to start the experiment, if the computer setup is also complete then start the measurement by clicking on the green play button in the upper left of the screen.