



BILLING RATES - FY 10/11

DEPARTMENT NAME :

Physics and Astronomy

VICE-PRESIDENT AREA :

Academic Affairs

DESCRIPTION OF COMMODITY OR SERVICE :	UNIT OF BILLING	FY 10/11 RATE	CUSTOMERS BEING SERVED
Thermal Diffusivity Test Method (Netzsch 457 Laser Flash System)			
Test performed from room temp to 500°C, 6 temp points	sample	\$500.00	External
Test - first point is at 50°C; each additional temp point:	sample	\$75.00	"
Gold sputtering	sample	\$200.00	"
Sample cutting and shaping	sample	depends on difficulty	"

NOTES:

This system can provide measurements of thermal diffusivity over a range from room temperature to 1100°C; however, we normally only test to 500°C.

Sample size: 12.7 +/- 0.05 mm diameter, 2-3 mm thick, faces flat and parallel within 0.02 mm.

Other sample sizes: 8 mm square, 10 mm square, 25.4 mm round.

All samples should be \approx 2-3 mm thick and parallel to within 0.02 mm.



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High Temperature DSC (Netzsch 404 Pegasus DSC System)			
Test performed from room temp to 700°C	sample	\$350.00	External
Additional temp ranges (for each 100°C)	sample	\$100.00	"
(Operating Atmosphere - Argon Gas)			

NOTES:

This system can provide measurements of specific heat over a range from room temperature up to 1500°C; however, we normally only test to 700°C.

The sample sizes may vary. Usually 25-50 milligrams are needed. One flat side is required.

The sample should be less than 5 mm in width and less than 1 mm thick. The sample may have to be broken to fit into the small crucible.

A sample of the same composition and growth as used for the laser flash if used to calculate thermal conductivity is required.



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Low Temperature DSC (Quantum Design Physical Properties Measurement Test performed from room temp down to 2 K (Operating Atmosphere - High Vacuum using a Turbo Pump)	sample	\$500.00	External

NOTES:

Temperatures points at every 10K except at lower temperatures where the data density is greater.

Excessive data density will be quoted on an as-required basis.

The sample sizes may vary. Usually 5-50 milligrams are needed. One flat side is required.

The sample should be less than 5 mm in width and less than 1 mm thick. The sample may have to be broken to fit onto the small sample platform.

A sample of the same composition and growth as used for the laser flash if used to calculate thermal conductivity is required.

The same sample can be used for both high and low temperature heat capacity measurements.

CUSTOMERS ARE RESPONSIBLE FOR ANY DAMAGE THAT MAY OCCUR TO THE TEST EQUIPMENT AS A DIRECT RESULT OF TESTING THE MATERIAL IN ACCORDANCE WITH THE CUSTOMER COMPLETED TESTING INSTRUCTIONS FORM.

INSTRUMENT CLEANING OR PARTS REPLACEMENT CHARGES WILL BE CHARGED AT CURRENT RATES.



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Scanning Electron Microscopy			
Characterization is performed at room temperature and UHV conditions	sample	\$750.00	External
A thin coating of gold is sputtered to enhance the quality of the images	sample	\$250.00	External
Transmission Electron Microscopy			
Characterization is performed at room temperature and UHV conditions	sample	\$750.00	External
A thin coating of gold is sputtered to enhance the quality of the images	sample	\$250.00	External
Elemental analysis	sample	\$500.00	External

NOTES:

This characterization can provide evidence for the presence of nanostructures present in the sample.

The sample sizes may vary. A minimum of 50-100 milligrams are needed. One flat surface is required.

The elemental composition of the nanostructure can be provided.



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Raman Spectroscopy			
Raman spectroscopy is performed under ambient conditions	sample	\$500.00	External
For Raman spectroscopy of micron and sub-micron sized materials the micro-Raman set-	sample	\$500.00	External

NOTES:

This samples should be stable when excited with 10-100 mW of laser power at room temperature.

The sample sizes may vary. Usually 25-50 milligrams are needed. One flat side is required.

Synthesis

Nanostructured materials composing of carbon, boron, nitrogen, or semiconducting	sample	\$500.00	External
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NOTES:

The chemical vapor deposition or the pulsed laser vaporization methods will be used.

Usually 25-50 milligrams of sample will be provided.