

# Simultaneous Thermal Analyzer (STA)

Integrated TGA and DSC for Advanced Material Characterization

## INTRODUCTION

*“Reliable, Robust, Cost-Effective Thermal Analysis.”*

AMI is pleased to introduce its next-generation Simultaneous Thermal Analyzer (**STA**), a state-of-the-art instrument designed for advanced thermal analysis. Incorporating a 0.1-microgram balance resolution, sophisticated control algorithms, and an innovative hang-down design, this analyzer delivers exceptional precision and reliability in an affordable, high-performance system.

The **STA** Series enables simultaneous Thermogravimetric Analysis (TGA) and Differential Scanning Calorimetry (DSC)/Differential Thermal Analysis (DTA) on a single sample within a single run. Built for reliability and precision, the STA delivers comprehensive thermal profiles without the need to run multiple experiments—saving you both time and sample material.

Engineered for quality control, routine testing, academic research, and industrial R&D, the **STA** Series combines robust construction with user-friendly intuitive software, offering a cost-effective solution for high-precision thermal analysis.

The **STA** is controlled by the Infinity Pro Thermal Analysis software. This unique Windows based software offers a very simple interface with all the features you need to analyze your thermal data.



Figure 1. **STA** Simultaneous Thermal Analyzer

## DIVERSE MATERIAL ANALYSIS

- |                   |                     |                      |                             |
|-------------------|---------------------|----------------------|-----------------------------|
| ● Polymers        | ● Ceramics          | ● Pharmaceuticals    | ● Electronic Components     |
| ● Chemicals       | ● Glasses           | ● Catalyst Research  | ● Coals & other fuels       |
| ● Petrochemicals  | ● Composites        | ● Building Materials | ● Catalysts                 |
| ● Polymorphs      | ● Metals            | ● Propellants        | ● Nuclear Science Materials |
| ● Superconductors | ● Engineered alloys | ● Explosives         | ● Food and Biomaterials     |

## KEY FEATURES

### **True Hang-Down Balance Design**

Industry-leading stability, sensitivity, and long-term drift resistance for reliable and repeatable measurements without the need for buoyancy corrective experiments.

### **High Sensitivity Microbalance**

Sub-microgram-level accuracy across a broad temperature range, providing confidence in your thermal and mass loss data.

### **24-Bit Resolution**

High-precision measurement of temperature, delta T, and weight with minimal noise and high digital fidelity.

### **Small Swept Volume Furnace Cup (7.5mL)**

Enhances temperature uniformity and gas exchange efficiency.

### **Simultaneous TGA/DSC or DTA**

Perform thermogravimetric and calorimetric analyses in a single run—ideal for decomposition, oxidation, and phase transitions.

### **Dual Purge Gas System**

Separate channels for purge and protective gases allow for fine control of the experimental atmosphere.

### **Broad Temperature Range**

Furnace operation up to 1500°C under inert, oxidizing, or reducing gas environments.

### **Motor-Driven Furnace Lift**

Ensures automated, smooth movement of the furnace for consistent sample positioning.

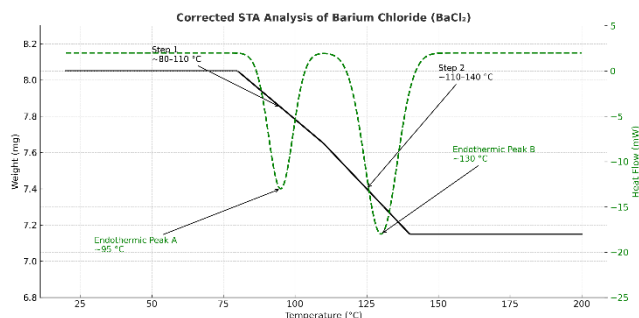
## STA SERIES OPTIONS

- **Evolved Gas Analysis (EGA) Compatibility**  
Interface with mass spectrometry (MS) or FTIR systems for evolved gas studies during thermal decomposition.
- **4-Gas Selector System**  
Automates delivery of up to four different gases for programmable switching during analysis.
- **Sub-Ambient System (650°C Model)**  
Low-temperature furnace models support experiments starting below room temperature
- **High-Temperature Flexibility**  
Optional DSC-only high-temperature mode to allow DSC-only to 1,500°C  
Optional TGA-only high-capacity mode for larger or reactive samples

## EXAMPLE DATA

### Barium Chloride

This is an example of a reference material that shows temperature and enthalpy accuracy. In addition, this represents a good example of a fused peak analysis.



### Calcium Oxalate

Calcium Oxalate is an excellent demonstration material for both DSC and TGA. This sample was run in the presence of Oxygen. The first DSC peak has an associated weight loss and represents bound water.

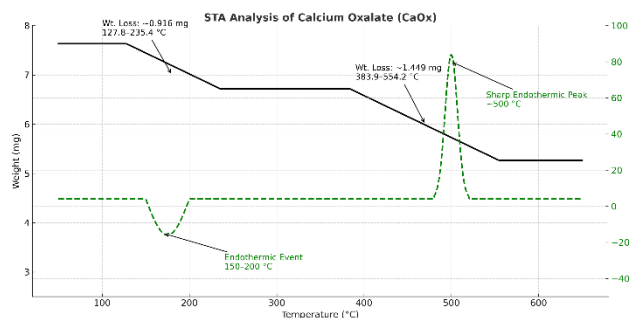


Figure 2. STA data analysis

## SPECIFICATIONS

Temperature	-40°C-650°C	Ambient to 1200°C	Ambient to 1500°C
Programmed Rate	0.1-100 °C/min	0.1-40 °C/min	0.1-40 °C/min
DSC Sensitivity	<1 µW	<4 µW	<4 µW
TGA Range	400 mg	400 mg	400 mg
TGA Readability	0.1 µg	0.1 µg	0.1 µg
Thermocouple	Type K	Type R	Type R
DSC/DTA mode	Yes	Yes	Yes