



Thermogravimetric Analysis (TGA)

Thermogravimetric Analysis (TGA) is a technique which monitors changes in the mass of a sample as a function of time and temperature.

Applications:

Materials Evaluation

Organic fillers
Polymer blends
Oils in rubber
Plasticizers in polymers
Low molecular weight monomers in polymers
Flame retardants in polymers and fabrics
Gas Adsorption in zeolites and catalysts
Inert and reactive gas studies

Failure Analysis

Residual solvents in pharmaceuticals
Outgassing of materials

Quality Control

Oxidative stability of solids
Quantitative Loading of Inorganic Fillers in Polymers
Moisture levels and drying characteristics in polymers and inorganic powders

Principle of Operation:

The sample is usually a solid but liquids may be analyzed as well. A small amount of a sample is placed in a quartz boat, which is suspended from one arm of a sensitive electro-balance. The suspended sample boat hangs inside a glass walled, computer controlled furnace, with gas tight fittings. A thermocouple, which is used to monitor the temperature at the sample, is also located in the furnace next to the sample boat. The furnace, electro-balance, thermocouple and gas flow controllers are monitored and commanded by PC software, allowing independent programming of constant temperature and temperature ramp segments, along with switching different gases during a run. Under the selected conditions, different organic and inorganic components are evolved or decomposed, leading to a mass loss which is measured by the electro-balance.

Data Output:

The data is a plot of mass change with changing temperature as shown

Sample Constraints:

Samples are typically in the tens of milligram range and can be solids or liquids.

