Thermogravimetric Analysis Basics

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Today's article looks at the introductory basics of a TGA. This article is geared toward those individuals who are unfamiliar with a TGA, and not for those who regularly use one.

What Does a TGA Do?

TGAs are the simplest of the thermal property testing equipment. Testing is a simple and straightforward Weight Loss over Temperature or time. Exceedingly straightforward, yet amazingly useful.

How Does a TGA Work?

The basic TGA utilizes a hanging arm microbalance to suspend a sample inside a furnace chamber. As the weight changes, the arm moves up and down. DSCs and TGAs can be combined using a deflection arm measurement system. This allows other thermal properties to be measured simultaneously with weight changes.

What Is a TGA Used For?

Here is a list of fields in which you are likely to encounter a TGA:

- Polymer/Thermoplastics
- Oil/Gas
- Food
- Biomaterials
- Recycling
- Cosmetics
- Biology/DNA
- Adhesives/Resins

How Not to Break the TGA…

TGAs are fairly robust units, but they have their weaknesses.

- Do not knock the furnace out of alignment.
- Vibrations can affect the weight measurement stability.
- Weight changes close to room temperature can be difficult to measure accurately.

Best Practices

A short list of ways to keep your TGA going for decades to come.

- Calibrate early… calibrate often.
- Be gentle with your samples.
- Do not shake the table during operation.
- Clean with an air purge gas and 590 Celsius.
- Give it a name, like “The Great Andorian,” and then give it proper respect!

Questions for my readers:

Post your answers and thoughts on these questions in the comments section:

Apart from the list above, what have you seen a TGA used for?
What other experiments would you add to compliment a TGA?

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