

Requirements Specification for Thermo-Gravimetric Analysis (TGA) Instrument

Requirements

Operational temperature range: ambient to 1100 °C

Temperature precision: ± 1 °C

Heating rate: 0.1 to 200 °C/min

Furnace cooling: 20 minutes or less from 1100 °C to 100 °C

Sample weight capacity: 0.75g

Weighing accuracy: $\pm 1\%$

Weighing precision: $\pm 0.01\%$

Sensitivity: 0.1ug

Baseline drift: 10ug

Gas switching/inputs: gas flow controlled by software for at least two gases

Volatile analysis: capable of accurate volatile analysis by means of sealed pans that are ruptured just before running

Auto sampler: capable of holding and automating the running of at least 20 samples

Capable of adding additional analysis equipment, specifically a mass spectrometer (MS) and Fourier transform infrared spectrometer (FTIR), to TGA instrument in the future

Connectivity of instrument to computer should be by means of Ethernet cable

Computer (equivalent to NASA standard desktop)

Intel Core i5-2400 3.1 GHz; 4 GB Ram; 500GB Hard Disk Drive; 23" LCD monitor; CD-RW drive or better

Software

Shall be compatible with Windows 7 operating system

Real-time display and plotting of specified measured and calculated values

Archiving of data and test conditions and exporting as plain text

Graphing of data with user-selectable scaling and post-processing to identify thermal transitions, and printing of results.

Utilities

Instrument shall operate on 110V ac. Other requirements (e.g. compressed air) must be clearly named.

Accessories

Vendor to supply turnkey system including fixtures, all hoses, and cables, instruction/training manuals, and software.

Training/support

Provide on-site set-up and training