

CNS Analyzer (EA)

Make : ThermoFisher®

Model : FLASH EA 1112 series

Purpose: To measure C,N S contents (wt.%) in natural /environmental/ synthetic samples.

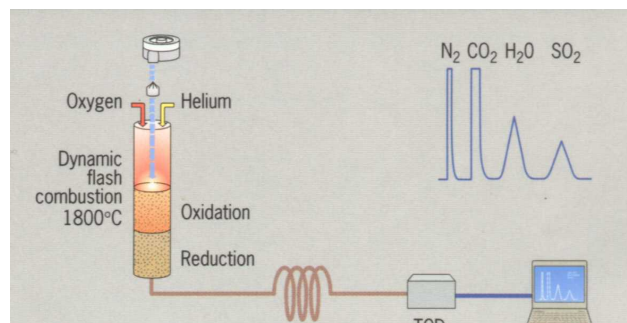
The instrument is used for absolute measurements of Carbon, Nitrogen and Sulfur contents in natural/archaeological/ environmental samples for diagnostic purpose for radiocarbon dating as well as for using the data for geochemical interpretations.



The system uses pure He as carrier gas and ultra-pure O₂ for flash combustion of samples. The analyzer is calibrated using a suite international and in-house laboratory standards to achieve high level of analytical precision (<2%) and accuracy.

Working Principle

The EA works on the principle of "Dumas method" which involves the complete and instantaneous oxidation of the sample by "flash combustion". The combustion products are separated by a chromatographic column and detected by the Thermal Conductivity Detector (T.C.D.), which gives an output signal proportional to the concentration of the individual components of the mixture. The schematic in the right panel is describes the major steps.



Major applications

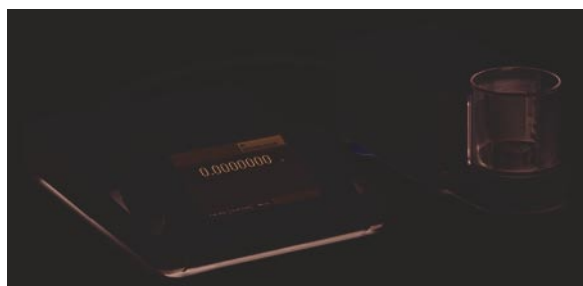
Organic compounds, Organometallics
Pharmaceuticals
Food & Agricultural Industries
Chemistry & Chemical Engineering

Geological & Environmental samples
Gasoline and fuels, Coal and coke
Graphite and carbides
Metals and alloys, Polymers and explosives

Dried and powdered samples are firstly weighed on ultrahigh sensitive analytical balance (shown below), packed in Tin/ Silver cups (from ~0.2mg to 30mg) in compact pellets. These pellets are then combusted in a in a combustion reactor at ~1000°C. Evolved gases are separated on a gas chromatographic column, and analyzed using a thermal conductivity detector (TCD). Temperature rises to ~1800°C in presence of pure O₂, causing the sample to complete combustion. Evolved gases are converted to carbon dioxide (CO₂); nitrogen to nitrogen (N₂) gas/ oxides of nitrogen and sulfur to sulfur dioxide (SO₂). Detection of the gases can be carried out in a variety of ways including (i) a GC separation followed by quantification using thermal conductivity detection The gas mixture containing N₂, CO₂, and SO₂ flows into the chromatographic column, which separate them using different retention times. Finally they are detected with the help of Thermal Conductivity Detector, where electrical signals processed by the *Eager 300* software provide percentages of Nitrogen, Carbon, and Sulfur contained in the sample.

The instrument is calibrated with the analysis of standard compounds using the K factor or linear- calibration methods.

Ultra-sensitive analytical balance



User Instruction

Samples should be solid powders, well-dried and homogeneous.

Charges excluding GST (18%)

For Institutional researchers	INR 250
For Other Institute/ University investigators	INR 500
For Industries	INR 1000

Contact Us

Email: rajesh.agnihotri@bsip.res.in; rajagni9@gmail.com; director@bsip.res.in **Contact No :** 0522-2742905, +91-9582570340