CHNS-ANALYSIS / O-ANALYSIS

References:
Instruction manual EA 1110
Elemental Analyzers (CE Instruments).

CHNS-Analysis

The determination of Carbon, Hydrogen, Nitrogen and Sulfur content is carried out by a simultaneous analysis.

1 Solid and liquid samples, weighed in tin capsules, are introduced into a vertical quartz reactor heated at a temperature of 1020°C with a constant flow of helium stream.
2 A few seconds before introduction the helium stream was enriched with high purity oxygen.
3 The combustion gas mixture is driven through an tungsten oxide zone to achieved a complete quantitative oxidation following by a reduction step in a cupper zone to reduce nitrogen oxides and sulfuric anhydride to nitrogen and sulfurous anhydride.
4 The resulting four components N₂, CO₂, H₂O and SO₂ are separated in a chromatographic column and detected by a thermo conductivity detector.
5 The resulting signals, proportional to the amount of eluted gases, are analyzed by an automatic workstation which provides the sample elemental composition report.

O-Analysis

The determination of Oxygen is a separate analysis.

1 The samples are weighed in silver capsules.
2 These capsules are dropped into a pyrolysis reactor kept at a temperature of 1060°C and crossed by a helium stream.
3 The samples are undergone an immediate pyrolysis.
4 Pyrolysis gases are passed on a nickel-plated carbon layer that ensures a quantitative conversion of organic oxygen into carbon monoxide.
5 Carbon monoxide is separated from the other pyrolysis gases (CH₄, N₂, H₂ and other acid gases) in a GC column.
6 The gases are detected by a thermo conductivity detector.
7 The resulting signals, proportional to the amount of eluted gases, are analyzed by an automatic workstation which provides the sample elemental composition report.