

DATA BULLETIN

A versatile solution for simultaneous CHNS analysis of liquid fuels

Combustion analysis is an easy and straightforward technique for the characterization of liquid fuels. Liquid samples can be filled into tin capsules and analyzed using the standard solid autosampler of the UNICUBE®. For higher convenience, the vario liquid sampler (VLS) is optionally available for automated injection of liquids via a syringe.

Different liquid fuel samples were pipetted into tin capsules, sealed with a capsule sealing press, weighed, placed on the solid autosampler of the UNICUBE and analyzed five times. For determination of low sulfur concentrations, an optional sulfur IR detector was in use. The average CHNS concentration and absolute standard deviation of the analyses are presented in the table below.

SAMPLE	C [%]	H [%]	N [%]	S [%]
Diesel A	86.18 ± 0.05	13.63 ± 0.01	< 0.002	0.449 ± 0.001
Diesel B	85.94 ± 0.09	13.49 ± 0.03	< 0.002	< 0.001
Biofuel	76.92 ± 0.05	11.96 ± 0.01	< 0.002	0.062 ± 0.001
Heavy fuel oil A	86.16 ± 0.08	10.30 ± 0.07	0.347 ± 0.024	2.855 ± 0.021
Heavy fuel oil B	88.07 ± 0.03	11.63 ± 0.01	0.078 ± 0.011	0.112 ± 0.004

Direct Temperature Programmed Desorption (direct TPD) is a patented gas separation system used in the UNICUBE to easily handle high CO₂ loads generated from the combustion of fuels. The major advantage of direct TPD separation is that high loads of one gas (e.g. CO₂) are handled without affecting the peak separation of gases which are present in the fuel in much lower concentrations (e.g. N₂ or SO₂). In addition, peaks are better focused and become larger with direct TPD separation due to faster desorption of the gases, which in turn results in faster analysis time.

These features make UNICUBE a straightforward and robust solution capable of delivering the best simplicity and accuracy for fuel analysis.

Of course, UNICUBE is fully compliant to all relevant standards on combustion analysis of fuels, such as ASTM D5291 and ASTM D1552.

INSTRUMENT:

UNICUBE®

ACCESSORIES:

Capsule sealing press / VLS (optional)

DETAILS:

mode: CHNS with IR for S

sample: 10–15 mg liquid fuels



STANDARD:

ASTM D5291

ASTM D1552

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