

DATA BULLETIN



Analysis of nitrocellulose with the UNICUBE® trace

Nitrocellulose is not only known as an explosive, but it also has applications in the pharmaceutical industry. For example, it is one ingredient for the "Western Blot" in biochemical laboratories. The nitrogen content of nitrocellulose is one of the most important parameters determining its physical and chemical properties. In order to determine the rate of nitration of nitrocellulose, the total nitrogen content can be analyzed using different chromatographic or wet-chemical methods, mostly requiring long and tedious sample treatment and complex calibrations. A fast routine method for quantifying the absolute nitrogen content is high temperature combustion followed by detection of nitrogen by a thermal conductivity detector, for example using the UNICUBE trace.

Three different nitrocellulose samples were weighed in tin boats and analyzed with the UNICUBE trace. Both samples were analyzed ten times using a standard method. Acetanilide was used to determine the daily calibration factor.

SAMPLE	N [%]	SAMPLE	N [%]	SAMPLE	N [%]
Nitro-cellulose #1	13.561	Nitro-cellulose #2	12.080	Nitro-cellulose #3	11.057
	13.512		12.058		11.012
	13.522		12.064		11.026
	13.488		12.021		11.070
	13.511		12.044		11.065
	13.540		12.067		11.045
	13.533		12.083		11.091
	13.533		12.063		11.058
	13.539		12.069		11.077
	13.539		12.060		11.068
mean	13.528	mean	12.061	mean	11.057
SD	0.020	SD	0.018	SD	0.024

The high pressure which builds up during the combustion of an explosive has no influence on the result of the analysis. The large sample size of 50 mg enables the analysis of inhomogeneous samples without the potentially problematic need for milling the sample before the analysis.

INSTRUMENT:
UNICUBE® trace

DETAILS:
mode: N
sample: 50 mg nitrocellulose



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