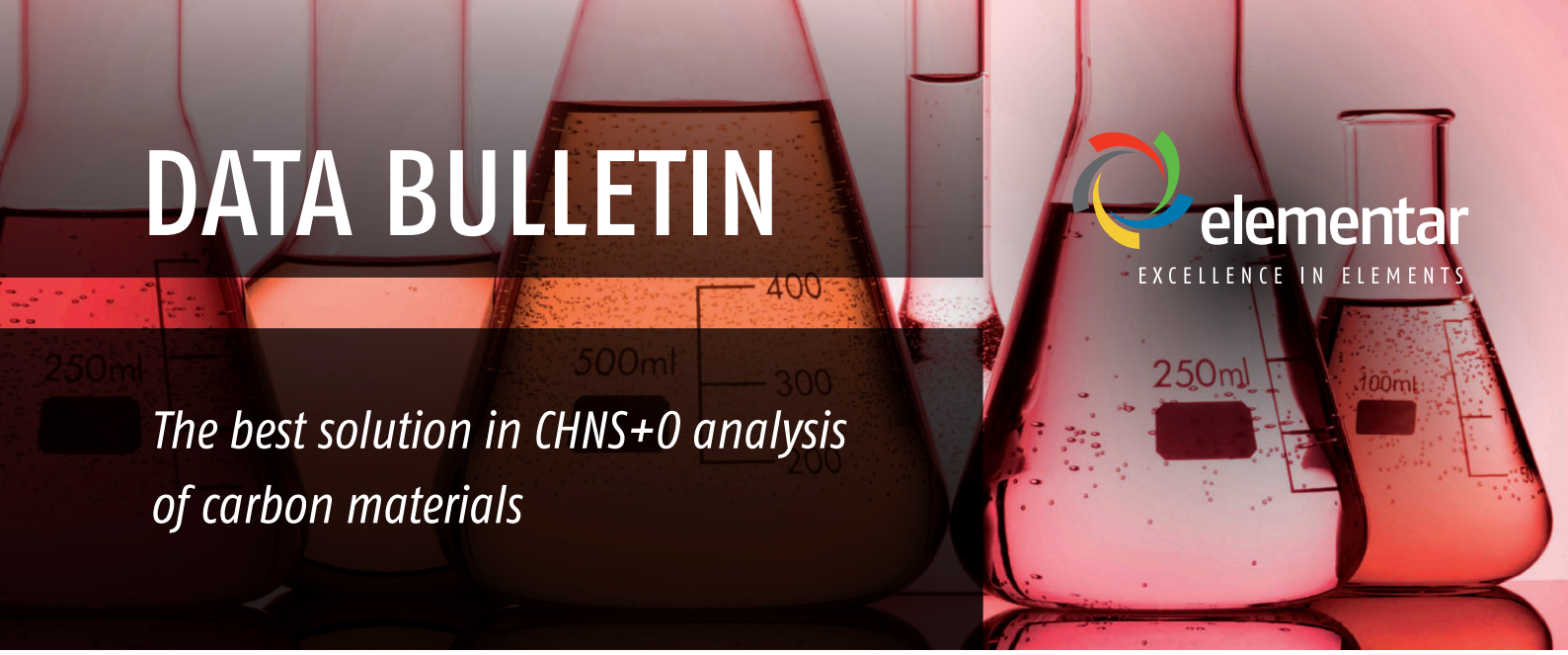

DATA BULLETIN

elementar
EXCELLENCE IN ELEMENTS

The best solution in CHNS+O analysis of carbon materials

Elemental analysis is a straightforward solution for the product quality control of carbon materials. Even though elements other than carbon are only present in minor concentrations, it is critical to measure their concentrations accurately. In order to guarantee quantitative combustion, even for difficult-to-combust samples such as high carbon content materials, the UNICUBE® uses an oxygen lance to direct the oxygen right to the spot where it is needed – inside the ash crucible where the sample is dropped. Using the oxygen kit, the UNICUBE can be converted into a high performance oxygen analyzer.

INSTRUMENT:
UNICUBE® with oxygen kit

DETAILS:
mode: CHNS and O
sample: 4-6 mg graphite / graphene

All samples were weighed into tin boats and analyzed with a standard method. The CHNS+O concentrations and absolute standard deviation of the analyses are presented in the table below.

SAMPLE	C [%]	H [%]	N [%]	S [%]	O [%]
Graphene A	98.89 ± 0.09	0.185 ± 0.007	0.167 ± 0.009	0.214 ± 0.005	0.704 ± 0.015
Graphene B	97.49 ± 0.10	0.161 ± 0.007	0.164 ± 0.011	0.307 ± 0.008	1.245 ± 0.020
Graphite	98.22 ± 0.12	0.140 ± 0.007	0.158 ± 0.012	0.508 ± 0.013	1.009 ± 0.032
Anthracite A	93.14 ± 0.03	4.05 ± 0.01	0.947 ± 0.023	0.308 ± 0.010	1.745 ± 0.014
Anthracite B	92.66 ± 0.08	4.33 ± 0.09	1.248 ± 0.014	0.427 ± 0.008	1.597 ± 0.014

In addition to the crucial quantitative combustion delivered by UNICUBE, the data also demonstrates that the patented gas separation system via Temperature Programmed Desorption (TPD) easily handles the high CO_2 loads generated from the combustion of graphene, graphite or anthracite. Even trace concentrations of nitrogen, hydrogen and sulfur can be reliably detected next to a very large carbon peak – delivering best simplicity and accuracy with UNICUBE.

Elementar Analysensysteme GmbH
Elementar-Straße 1
63505 Langenselbold (Germany)
phone: +49 (0) 6184 9393-0
info@elementar.de | www.elementar.de

02 / 2018 A