

# DATA BULLETIN

## *Analysis of carbon and sulfur in coal using the rapid CS cube*

The rapid CS cube was developed for fast automatic sulfur content determination by high temperature decomposition and IR detection. The rapid CS cube can optionally be equipped with a second IR detector for simultaneous CS determination.

The coal samples were weighed into tin foil cups.  $WO_3$  was added in a ratio 1:1. All samples were analyzed twice.

The instrument was calibrated using certified coal standards. The difference between the CS content of two consecutive analyses of one sample is compared with the maximum allowed difference  $I(r)$  defined in ASTM D 4239 and ASTM D 5373 for S and C, respectively.

SAMPLE	S [%]	C [%]	DIFF. S	$I(r)$	DIFF. C	$I(r)$
coal-1 S = 0.27	0.275 0.268	61.4 61.6	0.007	0.028	0.22	0.64
coal-2 S = 0.61	0.640 0.646	72.5 72.5	0.06	0.039	0.02	0.64
coal-3 S = 0.96	0.962 0.962	78.9 79.1	0.0003	0.049	0.15	0.64
coal-4 S = 1.91	1.870 1.851	68.1 68.3	0.019	0.076	0.17	0.64
coal-5 S = 2.93	2.915 2.902	69.9 69.8	0.013	0.107	0.10	0.64
coal-6 S = 6.03	6.174 6.190	66.9 67.0	0.016	0.206	0.07	0.64

The results show that the C and S content in coal can be determined with a very high accuracy and precision using the rapid CS cube. The rapid CS cube exceeds the requirements for repeatability of the international standards ASTM D 4239 and ASTM D 5373.

Using the optional IR detector for C, fast detection of carbon and sulfur can be simultaneously performed in coal samples with the rapid CS cube.

### INSTRUMENT:

rapid CS cube

### DETAILS:

carrier gas: oxygen

sample: 100 mg coal



### STANDARD:

ASTM D 4239, ASTM D 5373

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