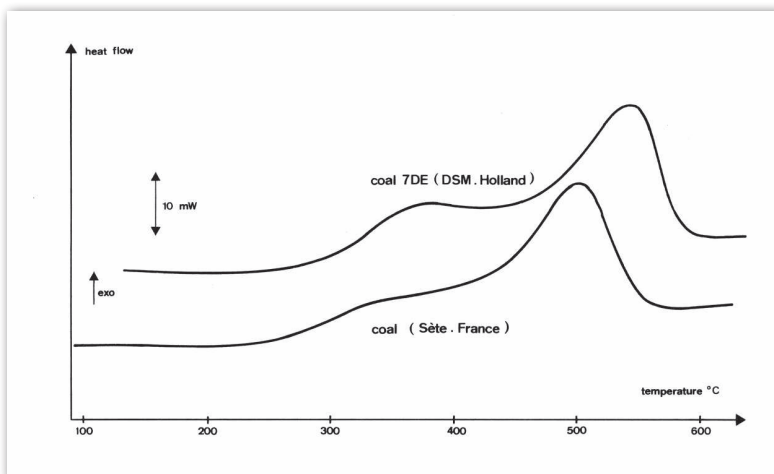


Combustion of coal

INTRODUCTION

In the case of coal products, the calorific value is usually determined with bomb calorimeters. This type of method is accurate, but does not yield information on the combustion reaction. Differential Scanning Calorimetry allows another approach of the combustion investigation. The heat of combustion is measured, referring to a standard coal with a well known heat content (in this case coal 7 DE from DSM Holland).



EXPERIMENT

Samples :

- Coal 7 DE (DSM, Holland) 0.954 mg
- Coal (Sète, France) 1.140 mg

Crucible : open alumina boat

Atmosphere : oxygen

Heating mode : 10 K/min

RESULTS AND CONCLUSION

Heating of the coal samples in an open crucible under a constant flow of oxygen gives a thermogram with two steps of combustion between 200°C and 600°C.

The two peaks are more or less separated, depending on the type of coal.

Calorific value are the following :

- Coal 7 DE (known) : 7892 cal.g⁻¹
- Coal (Sète) : 5538 cal.g⁻¹

Bomb calorimetry has given a calorific value equal to 5600 cal.g⁻¹. Results obtained with the two methods are in good agreement.

INSTRUMENT

CALVET PRO DSC

-120 to 830°C



HIGHEST HEAT MEASUREMENT ACCURACY

3D sensor based on thermocouples with Joule effect calibration.

EXTERNAL COUPLING CAPABILITY

CONVENIENT INTERCHANGEABLE CRUCIBLES AND CELLS to perform even the most demanding experiments using one instrument :

- high pressure (1000bar) and high vacuum
- pressure measurement and control
- mixing experiment