

## Proximate analysis of a coal

### INTRODUCTION

Proximate analysis provides information about the composition of a coal and allows its ranking for industrial use. Proximate analysis determines the moisture content, volatile matter (gases released when coal is heated), fixed carbon (solid fuel left after the volatile matter is driven off), and ash (impurities consisting of silica, iron, alumina, and other incombustible matter).

### EXPERIMENT

- Sample : 139.7 mg of coal.
- Crucible : platinum 500 $\mu$ l.

The furnace is first flushed with a high flow of nitrogen; then the following program is used:

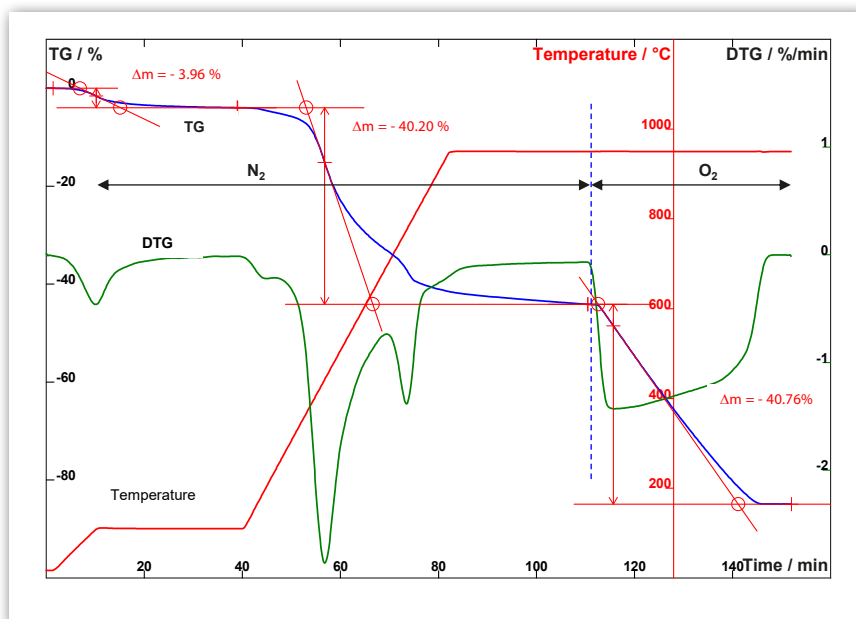
- Heating up to 110°C at 5 K/min, under a small flow of N<sub>2</sub>, then holding at 110°C to constant mass.
- Heating up to 950°C at 10 K/min, under N<sub>2</sub>, then switching to O<sub>2</sub> and holding at 950°C to constant mass.

### INSTRUMENT

LABSYS evo TGA



- **HIGH SENSITIVITY BALANCE FOR THE DETECTION OF SMALL MASS VARIATIONS** specifically designed for TGA analysis.
- **CONVENIENCE OF ONE FURNACE** to reach temperatures as high as **1150°C or 1600°C**.
- **PLUG AND PLAY INTERCHANGEABLE RODS** to perform TGA only, TG-DSC, TG-DTA, and 3D high sensitivity/Cp measurements.
- **EXTERNAL COUPLING CAPABILITY** including evolved gas analysers



### RESULTS AND CONCLUSION

The different mass losses make it possible to determine the following proportions :

- moisture : 3.96 %
- volatiles : 40.20 %
- fixed carbon : 40.76 %
- ashes : 15.08 %

Notice : the ash content corresponds to the remaining fraction at 950°C after reaction under oxygen.