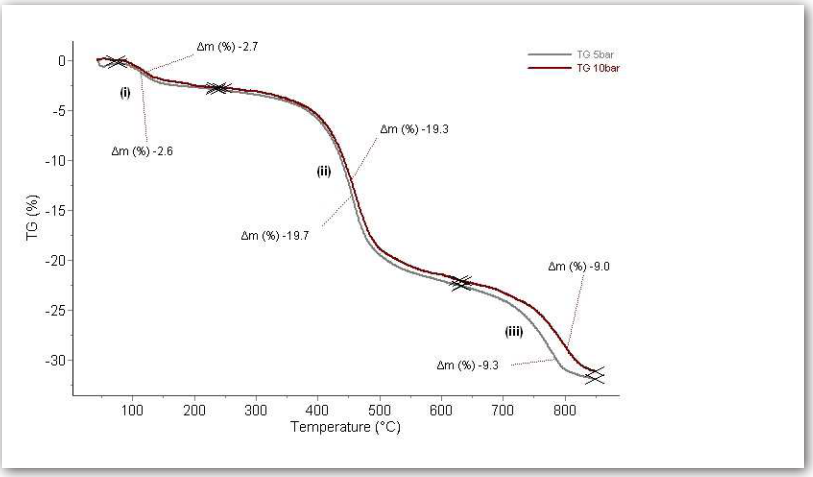
Coal Gasification at high pressures

INTRODUCTION

Pyrolysis is a coal conversion technology that plays an important role for the production of different chemicals like methane, hydrogen, different organic fractions or sulfur compounds.

The added values of Thermogravimetric Analysis (TGA) and more particularly high pressure TGA in that field is its potential to characterize the coal feedstock and provide data on the coal pyrolysis that are useful to control the industrial process, like pyrolysis conversion and pyrolysis rate.



EXPERIMENT

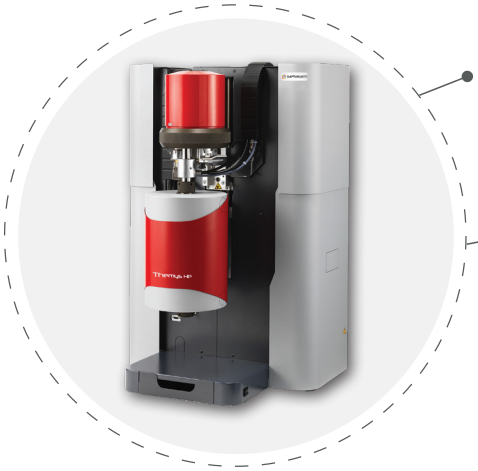
Coal samples from the Longkou region, in the Shandong county (China) where placed in an alumina crucible in the THEMYS HP.
They were heated from 50 to 850 °C at 10°C / min under. The first (68.7 mg) sample was tested under an argon flow at 5 bar and the second (76 mg) was tested under an argon flow at 10 bar.

RESULTS AND CONCLUSION

Three main mass losses are detected:
(i) Below 250 °C, drying of the sample. It allows for the determination of the water (moisture) content
(ii) Between 250°C and 650°C, evolution of the light hydrocarbons
(iii) Between 650°C and 850°C, evolution of the heavy hydrocarbons
At higher pressures, these steps are shifted to higher temperatures. Coal gasification, under oxidative conditions, can also be studied.

INSTRUMENT

THEMYS HP



HIGH TEMPERATURE AND HIGH PRESSURE CAPABILITY
up to 1200 °C and 150 bar with a single furnace

High Accuracy and Versatile Hang-down Symmetrical Beam Balance
continuously measure sample mass variations, drastically limit the TGA signal background noise and reduce drift, improve gas/sample interaction and specially designed for TGA applications

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