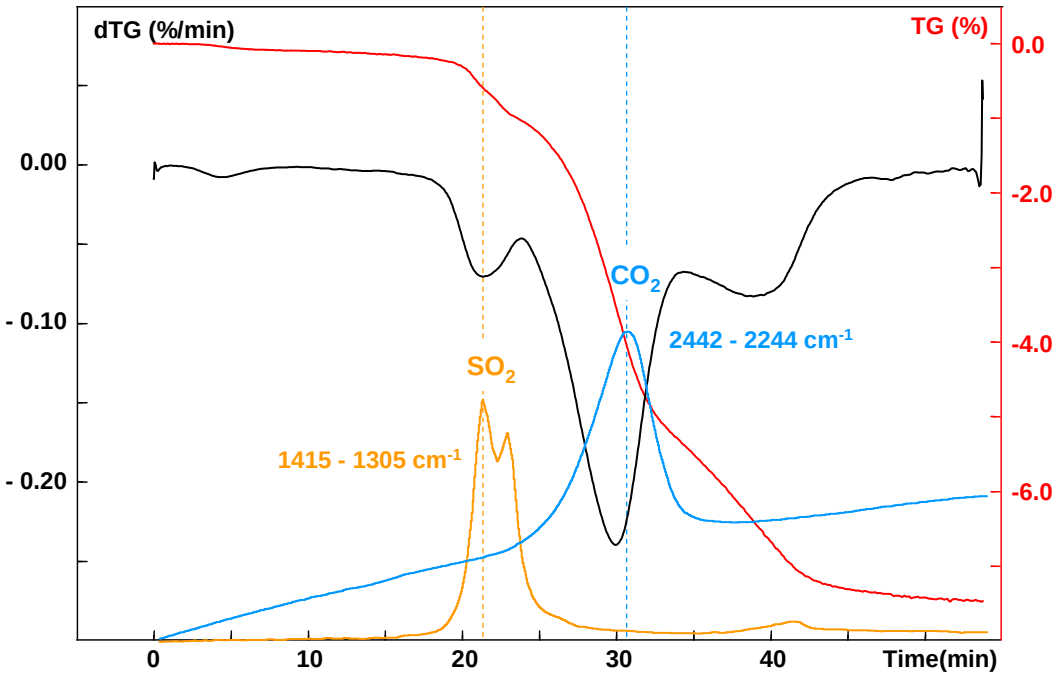
Analysis of cement samples by thermogravimetry coupled with FTIR spectrometry

Introduction: The aim of these analysis is to identify the evolve gas from a cement sample by thermogravimetry coupled with FTIR spectrometry.



Experimental

Experiments were conducted on a Setsys TG-DSC with the outlet of the balance connected to a Nicolet 380 IR spectrometer by heated connection part (maximum at 200℃).

The cement sample, previously attacked by HCl to remove its content in carbonate, was analyzed into a platinum container under air flow at a scan rate of 20 K/min from ambient temperature up to 1100℃.

The experimental conditions of FTIR spectrometer were:

- Scan numbers: 32 ;
- Resolution: 4 cm^{-1} ;
- Spectral domain: 4000 - 400 cm^{-1}.

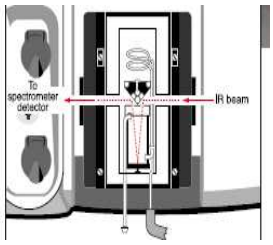
A blank is carried out in the same conditions and results provided have been corrected from this blank.

Results

At 22 min, we observe a decrease of the mass, two exothermic peaks and an increase of the IR intensity. Thanks to a library, we can associate this variation mass to the loss of SO_2.

In the same way, at 31 minutes, we note a big decrease of the mass, an exothermic peak and an increase of the IR intensity. This variation mass corresponds to the loss of CO_2 and water.

Cell gas accessory



Instrument :

Setsys Evolution TGA (ambient to 1600℃) coupled with FTIR Spectrometer