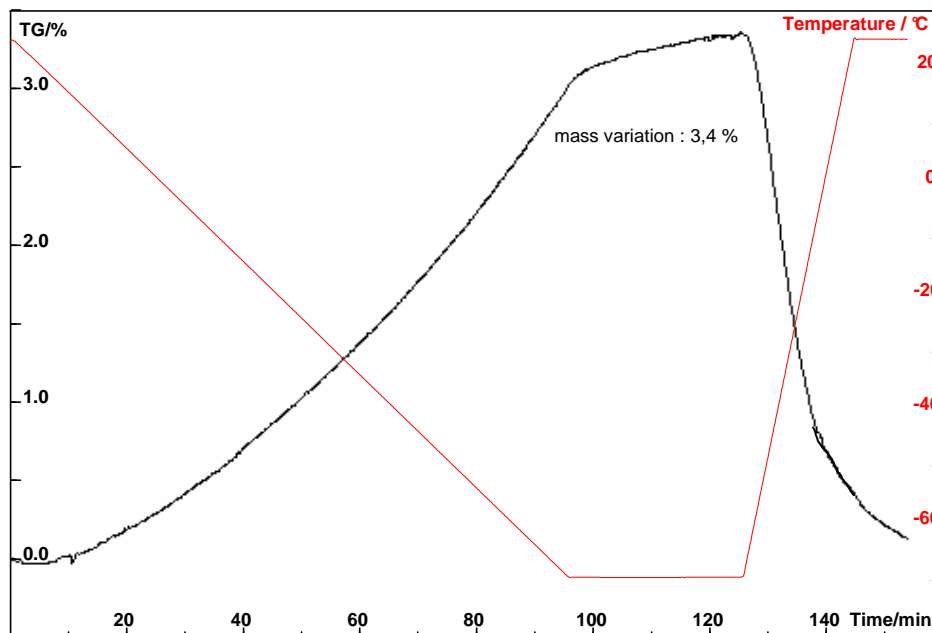


## Adsorption of CO<sub>2</sub> on a drug during its transport in dry ice

**Introduction:** Some drugs are unstable at ambient temperature. So, to transport or store them, producers use, for example, dry ice. Nevertheless, a problem can occur : the carbon dioxide can be adsorbed on the drug and, when the product is heated back to ambient, this gas is desorbed and a overpressure appears.

In order to simulate the conditions of transport and storage in dry ice, the sample is studied at -70°C under CO<sub>2</sub> in a thermobalance. The mass variation brings out the adsorption.



### Experimental

The experiment is carried out with SENSYS TG-DSC.

The sample is a drug and is analyzed under CO<sub>2</sub>.

Mass = 19.7 mg

The following temperature program is used:

- Cooling from 25°C down to -70°C at 1K.min<sup>-1</sup> under CO<sub>2</sub>.
- Waiting at -70°C during 30min under CO<sub>2</sub>.
- Heating from -70°C up to 25°C at 5K.min<sup>-1</sup> under CO<sub>2</sub>.

Aluminium crucibles have been used.

### Results

During the cooling under CO<sub>2</sub>, the sample's mass increases rapidly. The carbon dioxide is adsorbed on the drug.

This adsorption goes on during the isotherm at -70°C and the global gain mass observed is 3.4%.

When the sample is heated back to ambient, its mass decreases very quickly. All carbon dioxide is desorbed.

### Instrument

**SENSYS evo TG-DSC**  
-120 to 830°C



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