

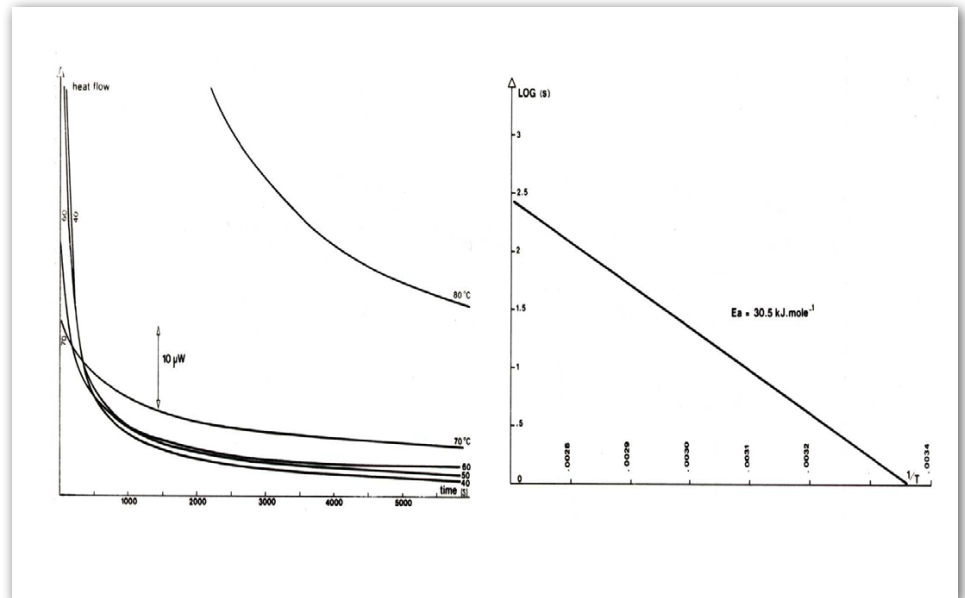
## Propellant stability

### INTRODUCTION

A propellant is generally a mixture of two substances which decompose strongly after ignition. But also in storage conditions this mixture can react very slowly and this process must be surveyed. It is accomplished by carrying out isothermal experiments with less than one gram of sample at different temperatures. The time between two experiments is only about 20 minutes.

### EXPERIMENT

- Sample : propellant
- Mass : 885 mg
- Vessel : sealed vessel
- Isotherms at 40°C, 50°C, 60°C, 70°C, and 80°C.



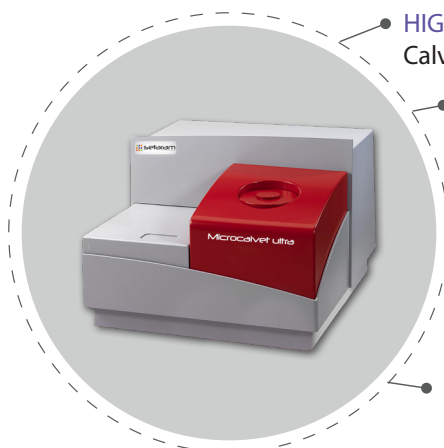
### RESULTS AND CONCLUSION

- The sample is introduced inside the calorimeter the temperature of which is maintained at 80°C.
- The signal is monitored during 6000s. Then the set temperature is adjusted to 70°C, and the signal monitored at 70°C shows an Arrhenius plot of Log (S) at 6000s versus 1/T.
- The calculated activation energy is then : 30.5 kJ.mol<sup>-1</sup>

### INSTRUMENT

#### MICROCALVET ULTRA

-20 to 170°C



#### HIGHEST HEAT MEASUREMENT ACCURACY

Calvet 3D sensor based on thermocouples with Joule effect calibration.

#### MODIFIABLE TEMPERATURE CONDITIONS

for increased flexibility and replication of real life conditions.

#### 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

#### EXTERNAL COUPLING CAPABILITY

designed to increase your research options including manometry, BET instrumentation, gas analyzers, humidity controllers and gas panels