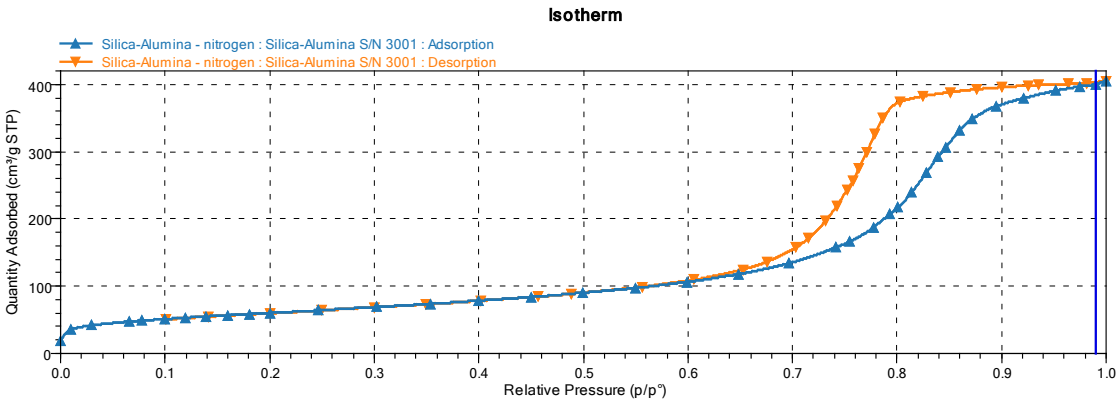
# Purpose and principle

Determine the specific surface area using the Brunauer, Emett and Teller 'BET' method, as well as the porosity (pore size distribution and pore volume) of a solid material.

The quantity of nitrogen adsorbed - desorbed (physisorption) by the solid at the temperature of liquid nitrogen (77K) as a function of the relative pressure (P/Po), between 10-3 and 1, is called the adsorption-desorption isotherm.




*Type IV isotherm*

This isotherm can be used to determine :

- the specific surface area (in $m^2/g$) of said solid by applying the BET model:
  - at 0.05<P/Po<0.3 for a mesoporous material (2 nm < dpore < 50 nm)
  - at a lower P/Po range determined using the Rouquerol BET for samples with very low porosity (low specific surface area)
- porosity over the entire adsorption-desorption isotherm obtained

# Technical specifications

- Equipment:
  - MICROMERITICS Tristar and Tristar II+ analysers
    - Possibility of carrying out up to 3 simultaneous analyses per Tristar instrument
  - MICROMERITICS VacPrep061 degassing station
    - Possibility of degassing 6 samples simultaneously at a temperature of up to 450°C (one temperature for all samples)
- Mesoporous solid: 2 nm < dpore < 50 nm
- Adsorbate : N2
- P/Po : 10-3 to 1
- Analysis temperature: 77K (liquid nitrogen temperature)


micromeritics
TriStar
Surface Area and Porosity Analyzer
Gas Adsorption Theory
micromeritics

*Tristar*


*Tristar II+*


*VacPrep 061*

# Analysis conditions / sample submission

- Sample = degassed powder stable under vacuum and temperature
  - Anticipate degassing conditions (humidity and potentially other gases adsorbed on the surface of the solid)
- Sample quantity: between 50 mg and 200 mg
- Use of glass tubes and rods for analysis:
  - ICPEES: At the charge of the different teams, references available from Fabrice VIGNERON
  - External: Use of those from the plateau
- Standard analysis (duration: a few hours) = day or overnight booking possible

# Contact and location

Our equipments for specific surface area and porosity analysis are available to both academic and industrial teams. The analysis department is located on the 1st level of building 104 (R4) in laboratory 3.

- Scientific Referee: **Dominique BÉGIN**
- Technical and training Referee: **Fabrice VIGNERON**

For information on how to access the department and its equipment, please contact the department referees.

For all requests for analysis (external) or training (internal), download the form below and return it to the department referees.

- **Formulaire de demande d'analyse/de formation - FR**
- **Analysis/training request form - EN**