

## Preparation and physico-chemical characterisation of biochars

*Applications possible until 28 October 2022 ([contact below](#))*

Biochars are porous carbonaceous materials derived from the pyrolysis of biomass and used for carbon sequestration, soil amendment and restoration in a circular economy approach. The objective of this collaborative project is to systematically characterise the textural and structural properties of biochars prepared by the project partners.

In order to characterise the biochars, different characterisation techniques will be used: infrared spectroscopy (molecular structure), Raman spectroscopy (microstructure), thermal analysis and chemisorption (surface chemistry). Particular attention will be paid to the characterisation of the textural properties of biochars by volumetric gas adsorption, mercury intrusion porosimetry and electron **microscopy**. **The student will be trained and autonomous on most of the measurement apparatus and associated softwares.**

The work will be carried out within the framework of a project of the Occitanie Region in collaboration with CIRAD (Montpellier) and a regional company specialised in sustainable agriculture and soil treatment. The trainee will work in the Balard building on the CNRS site (route de Mende) in Montpellier, in the D3-MPH department (Porous & Hybrid Materials).

*The student will be responsible for:*

**Carbonization** of biomass

**Management of the samples and data flow** in close collaboration with the project partners

**Physico-chemical characterisations** of carbonaceous materials: volumetric gas adsorption (N<sub>2</sub>, CO<sub>2</sub>, water vapor), mercury intrusion porosimetry, electron microscopy (transmission, scanning), FTIR, Raman, thermal analyses (ATG/DTP). The student will be **autonomous on most of the apparatus and associated operating softwares**

**Exploitation** of the data, **presentation** of the results during bi-monthly meetings in the presence of the project partners, **drafting** of monthly reports and a **complete final report**

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<i>Profile</i>	<b>Master's degree student or Engineering school student (M/F)</b> Background in chemistry or physical chemistry with knowledge about physico-chemical characterisations of <b>porous materials</b> Excellent <b>openness</b> and <b>curiosity</b> (interaction with agronomists) Required qualities: <b>motivation</b> , autonomy, <b>rigour</b> , teamwork
<i>Internship duration</i>	<b>5-6 months starting from 1 February 2023</b>
<i>Funding</i>	Occitanie Region <b>Monthly grant: ca. 560 €</b> The results obtained will be subject to confidentiality clauses
<i>Host laboratory</i>	ICGM - Département MPH, Campus CNRS, 1919, route de Mende, Montpellier
<i>Contact</i>	<b>Dr Nicolas Brun</b> , CNRS associate Researcher - <a href="mailto:nicolas.brun@enscm.fr">nicolas.brun@enscm.fr</a>
<i>Applications</i>	Only applications submitted before 28 October 2022 will be considered (see contact above) Attach a detailed <b>CV</b> , a recent letter of <b>recommendation</b> and a <b>cover letter</b>