



Thermal analysis of soil treated with biochars from different raw materials

Méndez Ana (1), Cely Paola (2), and Gascó Gabriel (2)

(1) Departamento de Ingeniería de Materiales, ETSI Minas, Universidad Politécnica de Madrid, Madrid, Spain (anamaria.mendez@upm.es), (2) Departamento de Edafología, ETSI Agrónomos, Universidad Politécnica de Madrid, Madrid, Spain

Thermal analysis (DTA, DSC, TG and dTG) has been used for decades to characterize carbonaceous materials used as fuels (oil, coal). In the last years, these techniques has been used with soils in order to assess proportions of labile and recalcitrant organic matter and to study the evolution of organic matter in amended soils during laboratory incubations. Indeed, thermogravimetric behaviour of soils can be quantified as the weight loss of samples attributed to different temperature ranges: WL1 from 25 to 150°C; WL2 from 200 to 350°C and WL3 from 375 to 600°C . WL2 and WL3 correspond to weight loss associated to organic matter combustion ($W_{org}=WL2+WL3$). It is established that first peak was associated with combustion of less humified organic matter, while the second one was related to the more humified. Also, the WL3/WL2 ratio, named thermostability index, was previously identified as a reliable parameter for evaluating the level of stability of organic matter in composts and other organic wastes that indicated the relative amount of the thermally more stable fraction of organic matter with respect to less stable one. These stability can be related with the soil CO₂ emmissions after biochar application. The objective of this presentation is to show the application of thermal analysis to study the stability of soil organic matter in soils treated with different biochars.