Prediction of the biochar carbon stability by thermal analysis

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Thermal analysis (DTA, DSC, TG and dTG) has been used for decades to characterize carbonaceous materials used as fuels (oil, coal). Our research group has used these techniques for the characterisation of different biochars in order to assess proportions of labile and recalcitrant organic matter and to study the evolution of soil organic matter in soils amended with biochar. Thermal analysis could be used to determine the proximate analysis, i.e. the percentage of humidity, volatile matter and fixed carbon or to calculate the thermostability index, previously identified as a reliable parameter for evaluating the level of stability of organic matter in organic wastes and biochar. Relationship between the stability of biochar, the raw material and the pyrolysis conditions could be established by thermal analysis techniques.