

ABSTRACT

The objective of this work is the study of the pyrolysis process of date palm biomass main constituents related to the Ghars (GH) and Deglet Nour (DN) cultivars, i.e., petiole (KER), palm (DJ), rachis (AD), spathe (KH), fibrilium (LIF), fruit bunch (ARJ), and its peduncle (SA). The pyrolysis behaviour of this lignocellulosic biomass and the determination of the kinetic constants were performed by Thermogravimetric analysis (TGA). The statistical approach used for the examination of TGA data is the Analysis of Variance and the Principal Component Analysis applied to thermal, kinetics, and chemical parameters. The results show that phoenicicole biomass appears much more interesting in comparison with the conventional solids biocombustibles. Indeed, the activation energy is estimated at the average of 24.27 kJ/mol for all studied biomass. Moreover, two types of phoenicicole residue are characterized by their thermal behaviour: initially, LIF characterized by a low calorific value and thermal stability due to the high lignin content, then the fruit bunch, characterized by a great thermal reactivity and an interesting calorific value. The main correlations between thermal and chemical parameters were also performed.