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**Thermochemical conversion pathways of *Kappaphycus alvarezii* granules through study of kinetic models**

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**ABSTRACT**

*Kappaphycus alvarezii* seaweed belongs to the class of red alga (Rhodophyta). The granules obtained after recovery of “sap” (liquid plant stimulant) from freshly harvested alga is a promising biomass feedstock for energy application. Herein we report the kinetic behaviour of the granules using thermogravimetric analysis (TGA) at different heating rates in N<sub>2</sub> atmosphere and thermogravimetric mass (TG-MS) analysis. Sawdust as lignocellulosic biomass is considered for comparative study. Four different kinetic models (i) multilinear regression technique (ii) Friedman method (iii) Flynn-Wall-Ozawa (FWO) method and (iv) Kissinger-Akahira-Sunose (KAS) methods are used to evaluate the apparent activation energy ( $E_a$ ), the pre-exponential factor ( $A_a$ ) and the overall reaction order ( $n$ ). Maximum SO<sub>2</sub> peak at 300 °C and 950 °C (from TG-MS), indicates that slow pyrolysis at 500 °C, with a packed bed lime scrubber at the outlet during temperature rise, is the best suited thermochemical pathway for energy harnessing.

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