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Energy consumption and optimization of oven drying of *Chlorella Vulgris* using Response Surface Methodology

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Abstract—Algae grows in water, due to which moisture contents are higher relative to other biomass materials. Post harvesting of algae biomass require dewatering to get biomass, which contains 80-90 % moisture. Drying is crucial step prior to derive bioenergy components. In this work *Chlorella Vulgris* was oven dried to determine the optimum condition by using response surface methodology. Where effect of drying time (60,90,120min), temperature (60,80,100ºC) and wet biomass thickness (5,10,15mm) was studied for moisture removed, residual biomass (wet basis) and drying rate. Result depicts that 100ºC, 120 min and 5 mm is optimal drying condition, but high energy consumed. Experimental results showed good harmony with response surface model result (R^2=0.99). In view of energy consumption and to avoid the biomass ingredients degradation drying at 80°C is recommended.

Keywords—Wet biomass, Oven Drying, Power Consumption, Response Surface, Optimization