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Flocculation of Microalgae *Nannochloropsis* sp. using Chitosan

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Abstract. Microalgae *Nannochloropsis* sp. is known to contain high lipid that is an excellent renewable source for pharmaceutical product such as Omega-3 fatty acids. Dewatering of low-density microalgae culture is necessary to extract the product. In this study, flocculation of the microalgae was attempted using a natural flocculant, Chitosan. Flocculation efficiency was assessed at different pH (9, 10, 10.25) and dosage (100-350 ppm). Settle-ability, particle charges and size of the flocs were also evaluated. Auto flocculation efficiency was highest at 50% when pH was adjusted to 10.25 and lowest at pH 9 which only reached around 9.5%. At pH 10.25, highest flocculation efficiency was found when 150 ppm chitosan was added giving 93.9% efficiency which correspond to the lowest zeta-potential value of -20.9 mV. pH 9 still resulted in lowest efficiency even high chitosan dosage with highest at 30.7% when 250 ppm chitosan was added. 150 ppm chitosan addition at pH 10.25 also resulted in highest settleable solid volume fraction. The particle size of flocs from treatment at pH 10 and 10.25 with 150 ppm chitosan addition was mostly between 10 and 100 μ m higher than unflocculated samples with size below 10 μ m. Chitosan addition to *Nannochloropsis* sp. culture successfully flocculates the microalgae with high flocculation efficiency.

Keywords: flocculation; *Nannochloropsis* sp.; Chitosan, pH, efficiency