

ABSTRACT

ADSORPTION POWER ANALYSIS OF ACID-ACTIVATED REACTIVATED BLEACHING EARTH (RBE) ON CRUDE PALM OIL

By

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The reactivation process of *Deoiled Bleaching Earth* (DBE) produces *Reactivated Bleaching Earth* (RBE). RBE can be used as an adsorbent for *Crude Palm Oil* (CPO). One method of DBE reactivation is by using acid, where the type and concentration of acid affect the DBE activation process. This study aimed to determine the best acid type, the best acid concentration, and the best combination of acid type and concentration in the DBE reactivation process. This research used a factorial Randomized Complete Block Design (RCBD), there were 9 combinations with three repetitions. Acid type factors were HCl (M1), HNO₃ (M2), and H₂SO₄ (M3). Acid concentration factors were 4% (S1), 6% (S2), and 8% (S3). The resulting RBE was analyzed for yield, water content, and pH. Furthermore, RBE was used to bleach CPO. The *Bleached Palm Oil* (BPO) was then analyzed for water content, free fatty acid content, and bleaching efficiency. Data were analyzed by analysis of variance, followed by *Orthogonal Contrast* (OC) and *Orthogonal Polynomials* (OP) tests. The results showed that the best acid type was HNO₃ (nitric acid), the best acid concentration was 4% concentration, and the best combination of acid type and concentration was HNO₃ (nitric acid) with 8% concentration which produced a yield of 79,97%, pH of 6,73, moisture content of 3,35%, color bleaching efficiency of 17,29%, BPO free fatty acid content of 3,58%, and BPO moisture content of 0,18%.

Keywords: *Deoiled Bleaching Earth* (DBE), *Reactivated Bleaching Earth* (RBE), *Bleached Palm Oil* (BPO), bleaching, bleaching efficiency

ABSTRAK

ANALISIS DAYA ADSORPSI *REACTIVATED BLEACHING EARTH* (RBE) YANG DIAKTIVASI DENGAN ASAM PADA *CRUDE PALM OIL*

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Proses reaktivasi *Deoiled Bleaching Earth* (DBE) menghasilkan *Reactivated Bleaching Earth* (RBE). RBE dapat digunakan sebagai adsorben untuk *Crude Palm Oil* (CPO). Salah satu metode reaktivasi DBE adalah dengan menggunakan asam, dimana jenis dan konsentrasi asam mempengaruhi proses aktivasi DBE. Tujuan penelitian ini adalah untuk mengetahui jenis asam terbaik, konsentrasi asam terbaik, serta kombinasi jenis dan konsentrasi asam terbaik pada proses reaktivasi DBE. Penelitian ini menggunakan Rancangan Acak Kelompok Lengkap (RAKL) faktorial, terdapat 9 kombinasi dengan tiga kali pengulangan. Faktor jenis asam yaitu HCl (M1), HNO₃ (M2), dan H₂SO₄ (M3). Faktor konsentrasi asam yaitu 4% (S1), 6% (S2), dan 8% (S3). RBE yang dihasilkan dianalisa rendemen, kadar air, dan pH. Selanjutnya, RBE digunakan untuk memucatkan CPO. *Bleached Palm Oil* (BPO) kemudian dianalisa kadar air, kadar asam lemak bebas, dan efisiensi pemucatan. Data dianalisis dengan analisis sidik ragam, lalu dilanjutkan dengan uji *Orthogonal Contrast* (OC) dan *Orthogonal Polynomials* (OP). Hasil menunjukkan jenis asam terbaik adalah HNO₃ (asam nitrat), konsentrasi asam terbaik adalah konsentrasi 4%, serta kombinasi jenis dan konsentrasi asam yang terbaik adalah HNO₃ (asam nitrat) dengan konsentrasi 8% menghasilkan rendemen 79,97%, pH 6,73, kadar air 3,35%, efisiensi pemucatan warna 17,29%, kadar asam lemak bebas BPO 3,58%, dan kadar air BPO 0,18%.

Kata kunci: *Deoiled Bleaching Earth* (DBE), *Reactivated Bleaching Earth* (RBE), *Bleached Palm Oil* (BPO), pemucatan, efisiensi pemucatan