

RINGKASAN

Analisis ini dilakukan untuk menganalisis pengaruh variasi dosis koagulan ($\text{Al}_2(\text{SO}_4)_3$) dan flokulan (Na_2CO_3) terhadap efektivitas proses koagulasi-flokulasi dalam pengolahan air baku di unit Water Treatment Plant (WTP) Pabrik Kelapa Sawit PT Incasi Raya Pangian. Proses pengolahan air sangat penting karena air baku dari sungai memiliki tingkat kekeruhan tinggi dan harus diolah agar memenuhi standar kualitas untuk keperluan operasional pabrik. Metode yang digunakan adalah jar test, yaitu simulasi laboratorium untuk menentukan dosis optimal koagulan dan flokulan berdasarkan perubahan parameter kualitas air, khususnya pH dan *Total Dissolved Solids* (TDS). Hasil analisis menunjukkan bahwa dosis optimal adalah 11 ppm untuk koagulan dan 8 ppm untuk flokulan, yang mampu menghasilkan pH sebesar 6,5 dan TDS 21 ppm, sesuai dengan standar baku mutu air bersih Permenkes RI No. 32 Tahun 2017. Ditemukan pula bahwa peningkatan dosis koagulan dan flokulan umumnya menurunkan nilai TDS, namun dapat menyebabkan penurunan pH jika tidak diimbangi dengan bahan pengatur pH. Selain itu, curah hujan berpengaruh terhadap kualitas air baku, sehingga penyesuaian dosis kimia perlu dilakukan secara berkala. Penelitian ini menegaskan bahwa jar test merupakan metode efektif untuk mengoptimalkan penggunaan bahan kimia pada pengolahan air secara efisien dan sesuai standar.

SUMMARY

This analysis was conducted to analyze the effect of variations in coagulant ($\text{Al}_2(\text{SO}_4)_3$) and flocculant (Na_2CO_3) doses on the effectiveness of the coagulation-flocculation process in raw water treatment at the Water Treatment Plant (WTP) unit of the PT Incasi Raya Pangian Palm Oil Mill. The water treatment process is very important because raw water from the river has a high level of turbidity and must be treated to meet the quality standards for factory operational needs. The method used is the jar test, which is a laboratory simulation to determine the optimal dose of coagulant and flocculant based on changes in water quality parameters, especially pH and Total Dissolved Solids (TDS). The results of the analysis showed that the optimal dose was 11 ppm for coagulant and 8 ppm for flocculant, which was able to produce a pH of 6.5 and TDS of 21 ppm, in accordance with the clean water quality standards of the Indonesian Minister of Health Regulation No. 32 of 2017. It was also found that increasing the dose of coagulant and flocculant generally decreases the TDS value, but can cause a decrease in pH if not balanced with pH regulators. In addition, rainfall affects the quality of raw water, so that chemical dose adjustments need to be carried out periodically. This study confirms that the jar test is an effective method for optimizing the use of chemicals in water treatment efficiently and according to standards.

