OPTIMIZATION THE PROCESS OF FLOCULATION COAGULATION TO WASTE WATER OF HERBAL MEDICINE INDUSTRIES
(Study Case of PT SIDO MUNCUL)

Abstract

Waste water of herbal medicine industries, pharmacy, and beverages such Sido Muncul, consist of many organically substances (*Organic sludge*), others are harmless non-organic components, however, waste water has high value for dissolved soluble substance, suspended solid substance, COD and BOD, then it is required treatment stage. Waste water in herbal medicine activities such Sido Muncul sourced form many processing unit, include traditional herbal medicine processing unit, will carrying out waste water from washing the raw material, washing production processes instrument, while, waste water in food industries formed as crumb washing water, washing water in production tank, cooling, filling, etc (such as production process diagram above). PT Sido Muncul waste water has *hydraulic loud of* 130 m^3/day, *flow time* of 18 hours started from 06.00 – 24.00, and *peak flow* about 10 m^3/hours with waste water treatment cost about *Rp. 129.412,5 /m^3*.

*W*aste water treatment has performed by PT Sido Muncul with flocculation and coagulation methods, but this process has not yet give optimal result, therefore this research conducted, with the aim to get the best coagulation flocculation combination in reducing colloid components and suspended particle on waste water effluent, then this process can proceed more efficient, effective and reducing waste water treatment operational cost.

This research divided to two-step that is screening process variable and determine optimal dose of process variable. On screening of variable process, there is performed censorship using taguchi design to get three-process variable that most influencing coagulation flocculation process, which further used in determining optimal dose of process variable. Finally, it is performed optimal dose test to waste water. This research performed with turbidity as a key parameter.

The results shows that process variable of coagulant Ferro sulfate 200 mg/l, flocculant cationic 5 mg/l and pH circumstance = 7 becomes the most optimal condition, it shown from decreasing presentation of turbidity value that resulted from process variable that achieve 92,7 % with 14.0 FTU turbidity value. Waste water treatment cost can be reduced to *Rp. 26.040,0 /m^3*, so can be reduced waste water treatment operational cost about *79.88%*.

Keywords: Coagulation, Flocculation, Coagulant, Flocculant, Turbidity