PENURUNAN KADAR FENOL DAN COD PADA LIMBAH CAIR INDUSTRI CAT DENGAN TEKNOLOGI PLASMA PADA PERMUKAAN AIR

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ABSTRACT

The electrical discharge technology on the water surface, with the system of non-contact electrode, was used to treat wastewater from paint industry with phenol, pH, TS, and COD parameters. The electrical discharge consists of mix high energy electron and ion and produces active species with high oxidation potential i.e. $^{\cdot}OH$, $^{\cdot}O$, and O_3 which are important in organic matter decomposition. The research was conducted with variation in voltage (6,7,8, and 9 kV), the number circulation (1-6 times circulation), and oxygen gas source with constant flow rate 1.5 l/minute. The research showed that the highest rates of reduction of phenol, TS, and COD were achieved in the voltage of 9 kV and in the 6^{th} circulation. The final reduction rates of phenol, TS, and COD were 89.99%, 27.40, and 63.45%, respectively, whereas pH was lowered from 6.5 to 5. In order to achieve such efficiency, 1.575 kWh of energy input was needed. Based on quantitative analysis, voltage and number of circulation had a significant effect on the reduction of phenol parameters,but they had less significant of pH and TS parameters. Based on qualitative analysis, voltage was related with electrical energy, thus affecting the number of free electron, so that it affects the active species created in the reactor. The number of circulation was related with the contact intensity between organic matters in the wastewater with the active species, therefore the more the number of circulation employed, the more the amount of organic matters can be removed.

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***Keywords** : electrical discharge, phenol, oxidation, active species*