

**DECOLORIZATION OF PALM OIL MILL EFFLUENT (TPOME) BY
FENTON OXIDATION WITH ZERO-VALENT IRON AND HYDROGEN
PEROXIDE**

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ABSTRACT

DECOLORIZATION OF TREATED PALM OIL MILL EFFLUENT (TPOME) BY FENTON OXIDATION WITH ZERO-VALENT IRON AND HYDROGEN PEROXIDE

During the extraction of crude palm oil from the fresh fruit bunches large quantities of water which about 50% was used and ends up as palm oil mill effluent (POME) that contribute significantly to surface water pollution. POME is a thick brownish liquid that contain high amounts of total solid (11500-7900 mg/L), suspended solids (5000-54000 mg/L), oil and grease (130-18000 mg/L), COD (15000-100000 mg/L), and BOD (10250-43750 mg/L). There are several treatment technologies applied by most of palm oil mills to treat POME, but treated POME (TPOME) is still colored, and when it is discharged into river stream, caused the water to turns colored too. In this study, degradation of Fenton oxidation with zero-valent iron and hydrogen peroxide method was investigated, in order to provide an efficient method for decolorization of TPOME. The TPOME was collected from Sime Darby Oil Palm Plantation at Carey Island, Port Klang which contained COD (1030 mg/L) and color (470 Pt/Co). Two different surface area of zero-valent iron were used to obtained and choose for the best results. The results revealed that Fenton oxidation is effective to reduce the color up to 95.74% with 65.29% of COD in the effluent. However, the final quality of the treated effluent is still slightly above the DOE standards. Thus, in order to improve the final quality of treated effluent, it is recommended that the study should be repeated use zero-valent iron that can provide large surface area and reduce the use of hydrogen peroxide which may cause COD to increase.