

ABSTRAK

PERILAKU KOROSI DALAM LINGKUNGAN BIOMASSA PADA MILD STEEL DAN STAINLESS STEEL PADA TEMPERATUR 750 °C

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Baja AISI 1018, baja AISI 1018 lapis Al, *stainless steel* (SS) 304 dan *stainless steel* (SS) 310 dioksidasi dalam lingkungan tandan kosong kelapa sawit, ampas tebu, dan batubara, pada temperatur 750°C selama 169 jam. Baja AISI 1018 dilapisi dengan mencelupkan kedalam bak Al cair pada temperatur 700°C selama 2 menit untuk meningkatkan ketahanan korosi. Hasil pengujian diamati dengan pengukuran penambahan berat (*weight gain*), *Optical Microscope* (OM), *Scanning Electron Microscope* (SEM), dan *X-Ray diffraction* (XRD). Penambahan berat baja AISI 1018 menunjukkan tingkat pertumbuhan yang cepat, dibandingkan baja AISI 1018 lapis Al celup panas. Hasil penelitian didapatkan nilai laju korosi (mpy) tertinggi terdapat pada baja AISI 1018 dalam lingkungan batubara sebesar 267,21 mpy dan baja *stainless steel* 304 dalam lingkungan tandan kosong kelapa sawit sebesar 242,29 mpy dan terendah pada baja *stainless steel* 310 dalam lingkungan ampas tebu 0,52 mpy, sedangkan pada baja AISI 1018 lapis Al memiliki laju korosi 14,8 mpy dalam lingkungan tandan kosong kelapa sawit, 3,186 mpy lingkungan ampas tebu, 2,41 mpy lingkungan batubara. Besarnya laju korosi pada baja AISI 1018 akibat tidak adanya lapisan protektif yang mampu menahan laju oksidasi, hal yang sama dialami baja *stainless steel* 304 karena kandungan Cr relatif rendah terhadap kandungan Cr dalam *stainless steel* 310.

Kata kunci : Laju korosi, baja AISI 1018, *stainless steel* 304, *stainless steel* 310, Al-celup panas, tandan kosong kelapa sawit, ampas tebu, batubara

ABSTRACT

CORROSION BEHAVIOR IN THE BIOMASS ENVIRONMENT MILD STEEL AND STAINLESS STEEL AT 750 °C TEMPERATURE

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AISI 1018 steel, Al layer AISI 1018 steel, stainless steel (SS) 304 and stainless steel (SS) 310 are oxidized in the environment of oil palm empty fruit bunches, bagasse, and coal, at a temperature of 750 °C for 169 hours. AISI 1018 steel is coated by dipping into a liquid Al bath at 700 °C for 2 minutes to increase corrosion resistance. The test results were investigated by means of weight gain measurement, Optical Microscope (OM), Scanning Electron Microscope (SEM), and X-Ray diffraction (XRD). The addition of the weight of AISI 1018 steel shows a rapid growth rate, compared to AISI 1018 layers of hot dipped Al. The results showed that the highest corrosion rate (mpy) was found in AISI 1018 steel in the coal environment of 267.21 mpy and stainless steel 304 in the oil palm empty fruit bunch environment of 242.29 mpy and the lowest in 310 stainless steel in the bagasse environment 0.52 mpy, whereas the AISI 1018 layer Al steel has a corrosion rate of 14.8 mpy in an oil palm empty fruit bunch environment, 3,186 mpy sugarcane bagasse environment, 2.41 mpy coal environment. The magnitude of the corrosion rate in AISI 1018 steel is due to the absence of a protective layer that is able to withstand the rate of oxidation, the same is experienced by stainless steel 304 because the Cr content is relatively low to the Cr content in stainless steel 310

Keywords : Corrosion rate, AISI 1018 steel, stainless steel 304, stainless steel 310, hot dipping aluminium, empty oil palm bunches, bagasse, coal