Studi pengaruh waktu dan penambahan surfactant anionic terhadap laju korosi mikrobiologi baja karbon rendah jenis SA283 grade C pada lingkungan air pengolahan limbah secara biologi = Study effect of time and surfactant anionic addition to corrosion rate of material low carbon steel SA283 grade C in environment of waste water biological treatment

Ahmad Rofi Alfarabi, author

Abstrak

Penelitian ini bertujuan untuk mengetahui korelasi antara bakteri aerob yang digunakan pada instalasi pengolahan air limbah industri terhadap laju korosi baja rendah karbon jenis SA283 Grade C dengan variabel waktu, ketersediaan oksigen dan nutrien. Media lingkungan yang dipakai adalah air limbah yang telah berisi bakteri aerob yang berasal dari bak aerasi instalasi pengolahan air limbah. Penelitian dilakukan dengan 3 kondisi berbeda yakni tanpa penambahan gelembung dan nutrient, hanya penambahan gelembung, dan ada penambahan gelembung dan nutrien. Pengujian dilakukan selama 3,6,9,12, dan 15 hari. Selain itu dilakukan pengujian dengan variabel tambahan nutrien dengan rasio 1:10,1:20,1:30,1:40, dan 1:50 dengan 15 hari pengujian.

Hasil penelitian membuktikan adanya pengaruh bakteri aerob terhadap laju korosi yang terjadi dan mengakibatkan adanya fenomena korosi mikrobiologi. Laju korosi terbesar terjadi pada 3 hari pertama pengujian dan dalam kondisi adanya penambahan gelembung dan nutrien hingga mencapai 110 mpy. Sedangkan komposisi penambahan nutrient 1:10 memiliki laju korosi 14 mpy. Jumlah koloni bakteri terbesar terjadi pada 3 hari pertama pada kondisi ada penambahan gelembung dan nutrien hingga memiliki jumlah koloni sebanyak 1300 x 104 koloni. Nilai pH selama pengujian bergerak turun, hal ini membuktikan adanya aktifitas bakteri aerob yang menghasilkan kandungan asam pada media uji. Berdasarkan analisis permukaan spesimen kupon dapat ditunjukkan adanya korosi seragam yang ditandai dengan adanya tubercle akibat aktifitas bakteri aerob.

<hr><i>This study has purpose to determine the correlation between aerobic bacteria which used in the industrial wastewater treatment plant to corrosion rate of SA283 Grade C low carbon steel with time variable, oxygen and nutrient availability. Environmental media used wastewater from aeration basin which has contained aerobic. The study was conducted with 3 different conditions are without the addition of bubbles and nutrients, only the addition of bubbles, and addition of bubbles and nutrients. The tests were conducted for 3,6,9,12, and 15 days. In addition, testing with additional nutrient variables with ratio of 1 10,1 20,1 30,1 40, and 1 50 with 15 days of testing.

The results of this study proved the effect of aerobic bacteria on corrosion rate that occurred and resulted in the phenomenon of microbiological corrosion. The largest corrosion rate occurred in the first 3 days of testing in condition presence of bubbles and nutrients up to 110 mpy. While the composition of 1 10 nutrient addition has a corrosion rate of 14 mpy. The largest number of bacterial colonies occurred in the first 3 days under the condition of adding bubbles and nutrients to have the number of colonies as much as 1300 x 104 colonies. The pH value during the test moves down, this condition proves that the presence of aerobic bacteria activity can produces acid content on the test medium. Based on the analysis of surface sample

there is can be shown the existence of uniform corrosion characterized by the presence of tubercle due to the activity of aerobic bacteria.</i>