Pengaruh penambahan inhibitor dan biosida untuk korosi akibat mikroba pada kondisi stagnan dalam sistem air pendingin = The effect of inhibitor and biocide addition for microbially influenced corrosion mic in stagnant condition of cooling water system / Rene Indrawan Pratamora

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Abstrak

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Sistem air pendingin merupakan sistem resirkulasi terbuka yang berfungsi untuk mendinginkan air yang berasal dari proses suatu industri. Salah satu permasalahan yang timbul pada sistem air pendingin resirkulasi terbuka adalah pertumbuhan mikroba. Untuk mengendalikan pertumbuhan mikrobia pada sistem pendingin ditambahkan isothiazoline biocide dan dilakukan pemantauan terhadap
pertumbuhan mikroba pada air dalam sistem pendingin. Dari hasil pengamatan dapat dilihat pertumbuhan mikroorganisme akan semakin cepat sehubungan dengan lama waktu terutama apabila menara pendingin berada dalam kondisi diam (stagnan). Pertumbuhan mikroba ini dapat menyebabkan terjadi korosi pada sistem menara pendingin. Untuk mencegah proses korosi akibat mikroba ini, maka dilakukan inhibisi dengan menggunakan inhibitor phosphoric acid. Hasil
pengamatan menunjukkan bahwa konsentrasi optimum 100 ppm inhibitor phosphoric acid dengan penambahan 100 ppm isothiazoline biocide untuk menurunkan laju pertumbuhan mikroba. Kemampuan inhibisi korosi diinvestigasi melalui simulasi pengujian korosi yang terjadi pada sampel kupon yang direndam dalam kurun waktu tertentu dengan menggunakan air sistem menara pendingin. Pengujian ini dievaluasi dengan metode pengujian Tafel Polarisasi dan Electrochemical Impedance Spectroscopy (EIS).
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Cooling water system is an open recirculation system which serves to cool water from an
industrial process. One of the problems that arise in open recirculating cooling water systems is the growth of microbial. To control the growth of microbial in the cooling system added isothiazoline biocide chemicals and monitoring the growth of microbial in the water in the cooling system. From the observation can be seen to be the faster growth of microbial in relation to the length of time, especially if the cooling tower is at rest (stagnant). The growth of these microbial can cause corrosion in cooling water systems. To prevent the formation of corrosion due to these microbial, the inhibition is done by using the phosphoric acid inhibitor. The results showed that the optimum concentration of 100 ppm phosphoric acid inhibitor with the addition of 100 ppm isothiazoline biocide to reduce the rate of growth of microbial. Corrosion inhibition ability investigated through the simulation testing of corrosion that occurs on the coupon samples were immersed in a certain period of time by using water cooling tower systems. This test was evaluated by Tafel polarization test methods and Electrochemical Impedance Spectroscopy (EIS).;Cooling water system is an open recirculation system which serves to cool water from an
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