

Effect of methylene blue addition as a redox mediator on performance of microbial desalination cell by utilizing tempe wastewater

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Abstrak

The microbial desalination cell (MDC) is a modification of the microbial fuel cell (MFC) system. The microbial desalination cell is a sustainable technology to desalinate saltwater by directly utilizing the electrical power generated by bacteria during the oxidation process of organic matter. In this study, tempe wastewater will be used as a substrate. Methylene blue (MB) at concentrations of 100 μ M, 200 μ M, and 400 μ M in the anolyte is added as a redox mediator, and the effect on electricity production and desalination performance are evaluated. The average power density increases by 27.30% and 54.54% at MB concentrations of 100 μ M and 200 μ M, respectively. On the other hand, the increase of the MB concentration in the anolyte results in a decrease in the salt removal percentage. The observation made using a scanning electron microscope showed the presence of MB adsorption on the surface of the anion exchange membrane (AEM) and is suspected to be the cause of the disruption of anion transfer between MDC chambers causing a decrease in the salt removal percentage.