

Development of Spectrometry Whole Cell Biosensor Using Chlorophyll in *Anabaena Cylindrica* As Reporter

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ABSTRACT

Rapid urbanisation and industrialisation leads to heavy metal pollution which is highly dangerous for human health. There is a continuing need to develop a device that can monitor and detect the heavy metal pollution rapidly and easy to use. The study reported herein focused on the response of chlorophyll in cyanobacteria *Anabaena cylindrica* to copper (Cu) and lead (Pb). The decrease in OD measured at $\lambda=680$ nm confirmed the chlorophyll response to 0.001, 0.010, 0.100, 1.000 and 10.000 mg/L of Cu and Pb respectively. The cells gave a good response at pH 8. Tests showed a decreasing trend in OD with increasing concentration of both Cu and Pb, with linear detection ranges fell within 0.001 mg/L to 10.000 mg/L. The cells were found more sensitive to Cu than Pb. *A. cylindrica* is a good candidate to be used in whole cell biosensors and the biosensor developed in this study showed a good potential to be used in quantitative and qualitative detection of both Cu and Pb with the range of detection of 0.001 to 10.000 mg/L.