ES6.

CARROT CALLUS TISSUE-BASED BIOSENSOR FOR THE DETECTION OF HYDROGEN PEROXIDE

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Monitoring and quantitative determination of hydrogen peroxide is very important since, it is highly used in various industrial fields such as food, textile and dye industries. Hydrogen peroxide is also produced in living organisms during the normal cellular metabolism.

The carrot callus tissues which contain a high peroxidase activity was utilized to construct an amperometric biosensor for the detection of hydrogen peroxide. The tissue was incorporated into a carbon paste matrix along with ferrocene as an electron mediator. This biosensor is based on enzymatic reduction of hydrogen peroxide into water. The enzymatic reduction of hydrogen peroxide is monitored and quantitatively related to the amperometric current of ferrocene/ferrocenium couple at the electrode surface.

Amperometric responses of this bioelectrode for the sequential addition of 2.0×10^{-5} M hydrogen peroxide were obtained. The linear dynamic range of the sensor for hydrogen peroxide was found to be 1.99×10^{-5} M to 1.99×10^{-4} M and the lower detection limit 1.02×10^{-7} M hydrogen peroxide and the sensitivity of 17.8 uA mol^{-} with the optimized pH of 6.5 (0.1 M Phosphate buffer) and 6.4% tissue content. Other important characteristics of the sensor include fast response time of 2.5 sec. The co-efficient of variation and the life time of the sensor were also evaluated.

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