In this work, mushroom (Agaricus bisphorus) homogenate immobilized onto the glassy carbon electrode via gelatin and cross-linked by glutaraldehyde to construct an electrochemical biosensing system for alcohol detection [1,2]. As well as the optimization studies, analytical characterization was performed. Finally, the proposed system was applied to ethanol detection in different wine and beer samples.

In this method, an enzymatic reaction was followed up which is catalyzed by alcohol oxidase (EC 1.1.3.13). In the reaction ethanol was converted to acetaldehyde and hydrogen peroxide.[3]. Method based on the detection of reduction peaks of oxygen by using cyclic voltammetry between at 0.0 – 0.7 V by the biosensor.

\[
\text{Ethanol} + O_2 \rightarrow \text{Acetaldehyde} + H_2O_2
\]

Besides optimization of bioactive layer components studies, linear detection range, repeatability, substrate specificity, inhibitor and interference effects of some substances on the biosensor response, optimum temperature, optimum pH, buffer system and its concentration effects on the biosensor system response were also investigated.

The observed electrode response linearity depends on ethanol concentration range between 1.0 – 10.0 mM provides more sensitive results. In the optimization studies, phosphate buffer (pH 7.0, 50 mM) and 35°C were obtained as the optimum conditions. Reproducibility of the biosensor was also searched for ethanol concentration of 5 mM (n=4) and the average value (\( \bar{x} \)), standard deviation (SD) and variation of coefficient (CV%) were found as 5.093 mM, ± 0.40 mM and 7.90%, respectively.

References