Determination of Glucose using Flow Injection Analysis and Borate Selective Electrode

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This study focuses on the development of a flow injection analysis method that performs nonenzymatic glucose measurement. It is aimed to develop a more economical blood glucose monitoring system by measuring the instant blood glucose level indirectly with borate based ion selective electrode. A non-enzymatic electrode based on carbon nanotube-silver borate (CNT-SB) composite electrode was developed and integrated into a flow injection analysis system as a detector, and glucose measurement was performed. Potentiometric measurement was made with this detection chamber. Heights of potentiometric peaks obtained were used for the determination of the amount of glucose in blood samples. Repeated injections were tested by using a mini-sized separation column as stationary phase and successful results were obtained. In addition, boronic acid solution was used as a carrier solution in the system, and it is predicted to be more accessible and simple method than the present non-enzymatic methods as it has ability at neutral pH conditions. The developed glucose measurement system was simple, economic and fast.

Keywords: Borate Sensor, Diabetes Diagnosis, Economic Blood Glucose Measurement, Health quality, Sustainability.

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