

Electrochemical determination of nitrate from water sample using Ag-doped zeolite-modified expanded graphite composite electrode

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Abstract Ag-doped zeolite modified expanded graphite composite electrode (AgZEGE) was prepared and applied for the electrochemical determination of nitrate anion from aqueous solution. The electrochemical behaviour of nitrate anions on the electrode was investigated by cyclic voltammetry in 0.1 M NaOH supporting electrolyte. The AgZEGE exhibited the electrocatalytic activity towards the cathodic reduction of nitrate anions, which was also influenced by applied electrochemical technique. The electroanalytical performance for the electrochemical detection of nitrate was determined using cyclic voltammetry (CV), chronoamperometry (CA) and differential pulse voltammetry (DPV). An enhancement of electroanalytical parameters for the determination of nitrate at the EG-Z-Ag-Epoxy electrode was reached by applying a preconcentration step by adsorption on electrode surface prior to voltammetric quantification. Under this condition, the lowest limit of detection of 0.1 mM illustrates the analytical versatility of this electrode.

Keywords: Ag-doped zeolite, modified expanded graphite composite electrode, nitrate
