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丝素膜修饰电极**pH**电荷选择效应的研究

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摘要 研究了丝素膜的带电特性，其等电点在pH4.5附近，
利用丝系膜在等电点前后的两性荷电特性和电荷之间的静电作用，研制了丝素膜修饰石墨电极，
多巴胺在膜中的表观扩散系数为2.65×10^-7cm^2/s，其电极反应异相电子转移速率常数为8.9×10^-6cm/s，
电极用于神经递质类化合物体系的测定中，验证了此修饰电极的pH电荷选择效应。

关键词 丝素 多巴胺 神经递体 石墨电极 电子转移反应 修饰 膜电极 P H 电化学分析

分类号 0657

pH-responsive charge selective recognition based on silk fibroin membrane modified graphite electrodes

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Abstract The silk fibroin protein membrane is an amphoteric ion-exchange membrane composed of both weak acidic and weak basic groups. Its isoelectric point is pH 4.5 and the charge thereof is dependent on pH of the solution. This characteristics of the membrane was exploited in a chemical modified electrode in this paper. Silk fibroin protein membrane was modified on a graphite electrode, the pH- responsive function of the modified electrode was investigated. The apparent diffusion coefficient of DA in the fibroin membrane was 2.65×10^-7 cm^2/s. The rate constant of the heterogeneous electron transfer was calculated to be 8.9×10^-6 cm/s by computer fitting. When the modified electrode was applied to detect neurotransmitters, some metabolites and ascorbic acid did not interfere with the measurement.

Key words FIBROIN DOPAMINE NEUROTRANSMITTER GRAPHITE ELECTRODE ELECTRON TRANSFER REACTION MODIFICATION MEMBRANE ELECTRODES PH ELECTROCHEMICAL ANALYSIS

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