

論文 / 著書情報
Article / Book Information

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Title(English)	Electron Transfer Reactions at Enzyme-Modified Electrodes
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(博士課程)
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論文要約

THESIS ABSTRACT

専攻 : Department of	物質電子化学	専攻	申請学位 (専攻分野) : Academic Degree Requested	博士 (工学)
学籍番号 : Student ID Number	11D27104		指導教員 (主) : Academic Advisor(main)	大坂武男
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論文題目 Thesis Title	Electron Transfer Reactions at Enzyme-Modified Electrodes
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論文要約: Thermophilic laccase (Th-Lac), thermophilic prroloquinoline quione dependent glucose dehydrogenase (Th-PQQ-GDH) and bilirubin oxidase (BOx) modified electrodes were successfully fabricated. The thermophilic glucose/O₂ biofuel cell, which can be operated at elevated temperature higher than physiological conditions, was constructed using Th-Lac biocathode and Th-PQQ-GDH bioanode. The mediator([Fe(CN)₆]³⁻ and 2,2'-azino-bis(3-ethylbenzothiazoline-6- sulfonic acid (ABTS))assisted electron transfer (MET) and direct electron transfer (DET) of BOx takes place on BOx-modified electrodes have been demonstrated. The probable electron transfer mechanisms of MET and DET from electrode to BOx on BOx-modified electrodes have been discussed. The formal potentials of the T1 and T2/T3 cluster sites of BOx were estimated and were found to shift to the negative direction of potential with increasing pH. F⁻ inhibited the catalytic oxygen reduction reaction (ORR) by BOx, but did not inhibit the DET of BOx.
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