عنوان مقاله:

Optimization of Coenzyme Q10 Production by Gluconobacter japonicus FM10 Using Response Surface Methodology

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خلاصه مقاله:

Introduction: Coenzyme Q10 is one of the antioxidants with a worldwide market. Nowadays the coenzymeQ10 production has been considered by fermentation using microorganisms. In this study, the Response Surface Methodology was used to optimize culture composition for coenzyme Q10 production by a previously isolated bacterium, Gluconobacter japonicus FM10. Materials and methods: A central composite design was employed to optimize the culture composition including sorbitol, yeast extract, peptone, KH_2PO_4, and $MgSO_4$ for coenzyme Q10 production. The dry cell weight and coenzymeQ10 concentration were monitored as response variables and the desirability function approach was applied to obtain the optimum level for each factor. Results: Results showed that an average, ۳ mg/L of coenzyme Q10 was obtained when the optimized culture composition was employed (۱۱۰ g/L of sorbitol, ۲۵ g/L of yeast extract, ۳۵ g/L of peptone, ۰.۵ g/L of KH_2PO_4, and ۰.۵۵ g/L of $MgSO_4$). In addition, the expected dry cell weight reached ۶ g/L in the presence of ۹۰ g/L of sorbitol, ۱۷.۵ g/L of yeast extract, ۳۵ g/L of peptone, ۰ g/L of KH_2PO_4, and ۱.۷ g/L of $MgSO_4$. Conclusions: The results of regression analysis revealed that the concentrations of peptone and sorbitol were the most effective factors in producing coenzyme Q10 and dry cell weight, respectively.

کلمات کلیدی:

Coenzyme Q10, Gluconobacter japonicus, optimization, Response Surface Methodology

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