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Optimization of rhamnolipid production by biodegrading bacterial isolates using Plackett-Burman design

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Abstract

Biosurfactants are biological surfactants produced by microorganisms.

Pseudomonas species are well known for the production of the rhamnolipid biosurfactant. In this work, the production of rhamnolipid biosurfactant by *Pseudomonas* spp. was investigated and further optimized. Two Plackett-Burman designs to study the effect of carbon source, nitrogen source, C/N ratio, iron concentration, magnesium concentration, phenol toxicity, pH, temperature, agitation and sampling time were tested. The first design revealed an optimization that increased biosurfactant productivity by almost two to five folds for the tested isolates. However, using the second design showed no remarkable increase in biosurfactant productivity. An additional validation run was adopted using the predicted optimal medium with predicted optimal conditions. The validation run showed remarkable increase in the productivity of the tested isolates.

The use of microorganisms with biodegradation ability coupled with optimization of the parameters affecting productivity provide an efficient strategy for biosurfactant production.

Keywords: Multifactorial; Plackett-Burman; Rhamnolipid

1. Introduction

Biosurfactants are biological surfactants produced by different microorganisms as bacteria, yeasts and fungi. They are totally or partially extracellular amphipathic polymers containing polar and non-polar moieties. This amphipathic property allow

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