

## High Productivity Fed-Batch Process for Biosurfactant Production for Enhanced Oil Recovery Applications

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**Abstract :** The bacterium *B. subtilis* produced surfactin in conventional batch culture as a growth associated product and a growth rate (0.4 h<sup>-1</sup>). A fed-batch process was developed and the fermentative substrate and other nutrients were fed on hourly basis and according to the growth rate of the bacterium. Conversion of different quantities of Maldex-15 into surfactin was investigated in five different fermentation runs. In all runs, most of Maldex-15 was consumed and converted into surfactin and cell biomass with appreciable efficiencies. The best results were obtained with fermentation run supplied with 200 g Maldex-15. Up to 35.4 g.l<sup>-1</sup> of surfactin and cell biomass of 30.2 g.l<sup>-1</sup> were achieved in 12 hrs. Also, markedly substrate yield of 0.269 g/g and volumetric reactor productivity of 2.61 g.l<sup>-1</sup>.h<sup>-1</sup> were obtained confirming the establishment of a cost effective commercial surfactin production.

**Keywords :** *Bacillus subtilis*, biosurfactant, exponentially fed-batch fermentation, surfactin

**Conference Title :** ICSRD 2020 : International Conference on Scientific Research and Development

**Conference Location :** Chicago, United States

**Conference Dates :** December 12-13, 2020