

## Bioconversion of fructose to mannitol using *Leuconostoc* sp. strain immobilized on activated carbon

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Mannitol as a GRAS can be used as food additives; anticaking, stabilizing, thickening, and texturizing and as medical treatments; antioxidant for reducing plasma hydrogen peroxide [2]. Previously many studies on conventional mannitol fermentation processes by whole cells were reported, but there is little known about bacterial cell immobilization [1,3,4,5]. This study reports the conversion of fructose to mannitol in a packed bed reactor in semi-continuous mode bacterial cells immobilized on the activated carbons. A new strain producing mannitol from fructose was isolated from the broth of kimchi and designated as *Leuconostoc* sp. strain JY1. The immobilized reactor, a 250 x 60 mm glass column with water-cooling jacket, was packed with activated carbons (30 x 80 mesh) and connected to a peristaltic pump. Fructose (5% w/v) was pumped with an downward flow of 5 ml/min and the outlet stream was continuously recirculated into a reservoir and back to the column. Five consecutive batches using fresh medium for each one were carried out at 25°C. No column washing procedure was performed between each treatment batch. The mannitol and fructose to evaluate bioconversion efficiency were assayed by TLC. As the number of batches increased, the conversion yield was decreased. The highest yield (0.82 g/g) and productivity (0.56 g/l-h) were obtained in the first batch. An increased number of cycles should result in better system performance due to cell adaptation to the medium. However, cell wash-out occurred between cycles, causing the cell-particles to become unsaturated. Probably this caused to decrease the yield of mannitol.

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### References

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