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## Characterization of a Water-insoluble Polymer Producing Bacterium *Enterobacter* sp. CJF-002 for MEOR

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In the MEOR field test project conducted in Fuyu Oilfield, Jilin Province, China, *Enterobacter* sp. CJF-002 which produces water-insoluble polymer was injected into the reservoir. As a result, the volume of oil production in the test area increased by more than twice because the high permeable zones were plugged with the water-insoluble polymer produced by CJF-002, and the water channeling in the reservoir was reduced.

CJF-002 is a facultative anaerobe isolated from the rock of the oil reservoir in the Fuyu Oilfield. This microbe was identified as belonging to the genus *Enterobacter* based on 16S rRNA gene phylogenetic analysis. Cells are gram-negative, motile rods. The isolate was grown with 1% Chinese molasses as substrate and produced water-insoluble polymer *ca.* 180 mg·dw/l. This water-insoluble polymer could absorb water at 200 times the dry weight, and formed a gel in the culture medium. This water-insoluble polymer was a cellulose derivative which consisted mainly of glucose.

The effect of cultivation conditions, such as concentration of molasses, temperature, pH, salinity, sugar, oxygen, pressure and initial concentration of bacterium, were evaluated for the growth and production of water-insoluble polymer by CJF-002. CJF-002 was suitable

for the MEOR process in the Fuyu Oilfield, because this microbe could grow and produce adequate polymer under the conditions of the test field. Moreover, CJF-002 could be applied widely to a broad range of reservoirs, because growth and production of the water-insoluble polymer were observed under various reservoir conditions except the condition of greater than 1% salinity.

**Keywords:** [MEOR](#), [Enterobacter sp.](#), [Cellulose derivative](#), [Reservoir environment](#), [Field test](#)

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