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P343. Development of a low-cost culture medium for biopolymer production by *Rhizobium viscosum* CECT 908 and its potential application in Microbial Enhanced Oil Recovery

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Polymers are a versatile class of compounds that play an essential role in our society, being their production estimated in more than 180 million tons per year. Nowadays, the world market is dominated by synthetic and plant-derived polymers. Biopolymers of microbial origin are characterized by their better environmental compatibility and biodegradability when compared with the synthetic ones, and their production is faster than those obtained from plants. Microbial biopolymers usually exhibit excellent rheological properties, stability at a wide range of temperatures, salinities and pH values, as well as a broad variety of chemical structures, which results in different physicochemical and rheological properties. However, despite their outstanding properties, their application is still limited by their high production costs. In this work, an alternative low-cost culture medium was developed for biopolymer production by *Rhizobium viscosum* CECT 908, containing sugarcane molasses (60 g/L) and corn steep liquor (1%, v/v) as carbon and nitrogen sources, respectively. Using this low-cost medium, higher biopolymer production and apparent viscosity values (5.2 g/L and 6700 mPa s, respectively) were obtained comparing with the synthetic medium (2.3 g/L and 1100 mPa s), which contained glucose and yeast extract. As a result, the cost of the culture medium necessary to produce 1 Kg of biopolymer was reduced more than 20 times. The biopolymer produced in the alternative low-cost medium exhibited better rheological properties as compared to xanthan gum, including higher viscosity at the same concentration. Furthermore, it was found to be stable at temperatures up to 80ºC, NaCl concentrations as high as 200 g/L, and high shear rates (300 s-1). Polymers are widely used by the oil industry to increase the oil reservoirs productivity during the tertiary oil recovery processes. In sand-pack column assays performed using a heavy crude oil ($\eta_{40ºC}$= 170 mPa s), this biopolymer produced using the low-cost medium demonstrated a better performance than xanthan gum, recovering almost 50% of the entrapped oil. Results herein obtained highlight that the *R. viscosum* biopolymer is a promising candidate for application in MEOR as an alternative to the conventional microbial and synthetic polymers currently used.