Applying Microbiology on Shale Oil Extraction

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Oil shale is a kind of organic solid mineral resource which contains highly ash contents (> 40%). The earth contains abundant oil shale resources,but the traditional development of oil shalecosts high and brings secondary pollution problems. Based on this,we studied the possibility and efficiency of applying microbiologyin shale oil extraction which is environmentally friendly. Oil shalesamples are taken from a oil shale mine in Huadian, China. Threestrains which could extract oil from oil shale by generatingsurfactant have been found in oil mud. The extract efficiency ofthe mixed inocula RH could be up to 60.60% at 5d. 4domestication conditions including carbon sources, nitrogensources, pH and temperature are proved to influence the oilextractionresult. The best parameter of these 4 conditions havebeen determined. After the experiment of simulation conditions,here are conclusions: (1)the best vaccination is 5% and thecorresponding efficiency is 50.83%; (2)the best solid-liquid ratiois 2:10, and the extraction efficiency is 60.62%; (3)the bestoptimum particle size is 100 mesh, and the efficiency is 60.60%.At last, we set an ectopic extraction simulation in order to trackingchanges of pH, OD and extracting efficiency over time and testingthe stability of RH in industry application. This research providesa revolutionary idea of developing potential energy resource and the surfactant generating microorganism in oil have been studied.