

Beneficial Microbes: Food, Pharma, Aqua & Beverages Industry

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Desulfobacterium anilini: A beneficial microbe

Semiu Adebayo Kareem

Modibbo Adama University of Technology, Nigeria

About 90% of the hydrocarbons mined from the Earth are burnt for energy. Their combustion produces oxides of sulfur and nitrogen which are the principal source of acid rain. Most countries have imposed regulations to control their release. At the refineries, hydrodesulfurization (HDS) is currently performed to remove sulfur compounds from fossil fuels. This process is done at high temperatures and pressures by metal catalysis and is effective for removing inorganic sulfur and simple organic sulfur compounds. However, it is difficult to remove heterocyclic sulfur compounds. The high cost and inherent chemical limitations associated with HDS make alternatives to this technology of interest to the petroleum industry. Biodesulfurization which has two pathways, namely the sulfur-specific oxidative and the sulfur-specific reductive pathways has attracted attention as an alternative process to HDS and the sulfur-specific oxidative pathway has been extensively studied. There are very few reports on the desulfurization activity of sulfur reducing bacteria on DBT under well controlled sulfur-reducing anaerobic conditions. *Desulfobacterium anilini* was isolated by enrichment in an anaerobic jar and was subsequently identified after series of characteristic biochemical and morphological tests. Thereafter, its suitability for anaerobic desulfurization was investigated, it was found that it has great capability for that purpose, it remove over 80% of heterocyclic sulfur in both kerosene and diesel. The kinetics of the heterocyclic sulfur compounds in kerosene follows the zero order while the Michaelis Menten model described the kinetics observed in the removal of heterocyclic sulfur compounds in diesel. In view of the aforementioned, it is logical to conclude that *Desulfobacterium anilini* has a great benefit in the industry as a biocatalyst for heterocyclic sulfur compounds removal in real petroleum products.

Biography

Semiu Adebayo Kareem is currently working as a Researcher in Modibbo Adama University of Technology, Nigeria.

sakareem_1@mautech.edu.ng

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