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EASI-MS applied on Quantitation and quality control of biodiesel/petrodiesel (Bn) blends

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Abstract

Processes of petroleum hydrocarbons (HC) formation in literature have been discussing for 200 years. At present time there are two main theories of oil formation: organic (sedimentary-migration) and inorganic (abiotic). It is believed that n-alkanes formed from n-saturated fatty acids by decarboxylation. It is known that in the original organic matter (OM) fatty acids with an even number of carbon atoms in the molecule are prevail. In case sapropelic OM, low molecular weight acids (n-C_{16}, n-C_{18} and n-C_{20}) are mainly produced and if OM is humus higher molecular (n-C_{26}, n-C_{28} and n-C_{30}) are produced. It is important to note there are high molecular n-alkanes C_{23}, C_{25}, C_{27}, C_{29}, C_{31} and C_{33} in soil OM. Bacterial synthesis of n-alkanes could be accounted by decarboxylation with relatively high temperatures. However, this phenomenon doesn't support by experiment. In this work we studied, if n-alkanes with an odd number of carbon atoms in the molecule formed by bacteria. The objects of study were the hydrocarbon aerobic bacteria *Arthrobacter sp.* RV and the bacteria *Pseudomonas aeruginosa* RM, that are able to both aerobic and anaerobic growth in the process of denitrification. Both strains were grown in a mineral medium with glucose. As a result of vital activity of *Arthrobacter sp*. RV and *P.aeruginosa* RM n-alkanes with an odd number of atoms of "C" in the molecule formed. Both strains synthesized n-C_7, n-C_9, n-C_{11}, n-C_{13}, n-C_{15} and n-C_{17}. At the same time unsaturated n-fatty acids with an even number of atoms, n-C_8, n-C_{10}, n-C_{12}, n-C_{14}, n-C_{16} and n-C_{18} are generated in both species of bacteria. *Arthrobacter sp.* RV and *P.aeruginosa* RM synthesized unsaturated irregular izoprenan - squalene (2,6,10,15,19,23-geksametiltetrakoza-2,6,10,14,18,22-hexaen). Thus, n-alkanes with an odd number of carbon atoms are dominated not only by decarboxylation process, but during bacterial synthesis

Biography

Dr. Ildenize Barbosa da Silva Cunha, is a Brazilian Scientist, received bachelor's degree at Química Industrial from Universidade Federal da Paraíba and Masters in Organic Chemistry and doctorate at Analytical Chemistry from Universidade Estadual de Campinas-UNICAMP, Post-Doctorate on Laboratory Thomson of Mass Spectrometry from Universidade Estadual de Campinas-UNICAMP. Stayed 2 months at PRG-University of Calgary-Canada, adapting the technique EASI-MS. Has experience in Chemistry, acting on the following subjects: Ambient techniques in Mass Spectrometry, Quality control on: Biodiesel, oils, Bee products and natural products.