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## A NEW APPROACH ON THE BIOHYDROGEN PRODUCTION PROCESS VIA METHANE GENERATED FROM EFFLUENTS

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### Abstract

This paper analysis a new biohydrogen technological route generated from cashew residues in the Brazilian Northeast Agribusiness via methane production. It is known that agribusiness produces a large quantity of residues, mainly those generated in the food sector, where there is a plenty availability of sugar contained effluents, appropriated to produce methane or even biohydrogen. That is the case of the pseudo fruit of cashew, the peduncle, which is considered an exotic fruit due to its tannin tasty. There is in the Brazilian Northeast, about of 800.000 hectares of cashew plantations where the pseudo fruit of cashew is largely wasted. After the seventies, world agricultural and land use are suffering a challenging pressure to produce **biofuels** to replace fossil fuels. Inside this context, Methane and biohydrogen has gained a considerable attention, due to its sustainable conditions. Recently, the world automobile industry pointed out their challenging project to replace the actual inefficient intern combustion motors by batteries or hydrogen fuel cell driven vehicles, towards a **world green mobility**, free of CO<sub>2</sub> – emissions for small cars or even the thermoelectric power generation. So, **biohydrogen produced from renewable feedstocks, mainly wastes**, will assume a strategic position in the next decades. A broad analysis of the state of art of different biofuels technologies where made in previous authors publications. In this paper, it will be focused one analysis on the use of a new technological process route to produce biohydrogen using methane produced from effluents containing sugar, avoiding environmental problems. The idea is to combine the use of two well known technologies, the methane produced through the efficient UASB reactors associated with a catalytic methane cracking process to generate hydrogen and reduced carbon, which has large applicability in the metalwork industry, instead of the use of the classical light and dark fermentations. The previous analysis on methane produced technologies indicates that UASB reactors presents high yield and efficiency, and it is a well established technology, as well as the catalytic cracking of methane which has been considered a major technological route to produce biofuels in the recent analysis made by the German chemical industry. This seems to be a strategic and promising technological route to be focused aiming at to convert wasted bioresources into biofuels to attend future environmental sustainable requirements, as well as, the needs of the transport sector, power generation and the chemical industry. The technological route developed could be used to process other effluents or even other biomass type like microalgae, which has a great potential to be produced in the Brazilian Northeast.

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