



10th INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

“TEN YEARS WORKING TOGETHER FOR A SUSTAINABLE FUTURE”

Environmental and energetic performance evaluation of mouthwashes with different sensorial aspect from a Latin American plant

LOPES, L. C. ^{a*}, KULAY, L. ^a

a. Departamento de Engenharia Química da Escola Politécnica da Universidade de São Paulo, São Paulo

**Corresponding author, lucas.cubas@usp.br*

Abstract

Personal care industry is competitive and consumers' opinion – based on sensorial perception – is decisive for success of a product or brand. In this context, environmental factor may be a market differential. Hence, this study compared energetic and environmental performance related to the production of 1.0 m³ of two mouthwashes which meet different consumers for organoleptic aspects, but presenting the same primary function. The evaluation was conducted according to Life Cycle Assessment technique. This brought up that Product 'A', a formula with short chain alcohol, presents Primary Energy Demand equal to 77.4 GJ/FU, while Product 'B', containing alcohol with multiple hydroxyl groups, requires 20.3 GJ/FU. In terms of impacts from emissions, Product 'A' again demonstrated lower performance versus Product 'B'. In this case, unfavorable results of Climate Change, Agricultural Land Occupation and Water Depletion categories are pointed out. For all these impacts, significant contribution of inerting fluid is noticed in Product 'A' processing. Thus, consumption quantity of this utility material was varied for a Sensitivity Analysis. As reference for this estimative, the equivalence between Climate Change performance of 'A' and 'B' was assumed. In this condition, Product 'A' Primary Energy Demand decreased to 38.8 GJ/FU: a 50% reduction. In other exploratory assessment, Carbon Balance was carried out to both products, which sequestered CO₂ portions from air were incorporated and biogenic quantity of the same compound was emitted to atmosphere. From this perspective, environmental performance of 'A' significantly surpassed 'B', since the first product was able to capture more carbon than its emission. The conclusions of this study are useful for future developments which can be implemented in the product systems of both personal care items.

Keywords: *personal care; environmental performance; energetic performance; LCA; chemical processes.*