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WASTE TO ENERGY: RESPONSE SURFACE METHODOLOGY FOR OPTIMIZATION OF BIODIESEL PRODUCTION FROM LEATHER FLESHING WASTE

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Background: **The demand for diesel fuel is constantly increasing, requiring its alternate that could be sustainable, technically feasible, price competitive and ecologically acceptable. Biodiesel is one of ecologically acceptable substitute for the conventional fuels.**

Methods: **Sufficient lime fleshing waste was collected from Addis Ababa tannery. Wet limed leather fleshing waste were delimed using boric acid, dried, chopped and subjected to Soxhlet extraction. The oil was treated by orthophosphoric acid and distilled water to remove gums. Then it was subjected to homogenous base catalyzed transesterification. Response surface was used to optimize the process variables. GC-MS was done to see composition of the biodiesel.**

Result: **The oil yield of the goat, hide and sheep fleshing wastes were 23.08%, 12.05% and 26.7% respectively. The conversion to biodiesel by KOH catalyzed transesterification was achieved above 96% under optimum conditions: a methanol-to-oil molar ratio of 6:1, catalyst amount of 1 % w/w, reaction temperature of 60 °C for an hour reaction time.**

Conclusion: **It was proved that fleshing wastes from tanneries that storage and disposal are both troublesome and costly could be transformed to a fuel with low emission values and a performance close to diesel fuel.**

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