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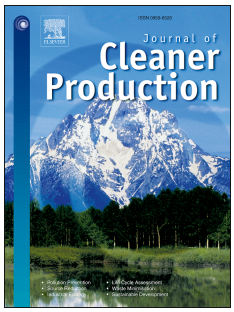

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Bio-lubricants production from fish oil residue by transesterification with trimethylolpropane

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Abstract

The fatty acid ethyl esters mixture, a fish oil residue obtained after the extraction of omega-3 polyunsaturated fatty esters, has been converted into mixtures of mono-, di-, and triesters of trimethylolpropane by transesterification at 100-140ºC under vacuum with sodium ethoxide as catalyst. This method has shown to be more efficient than the enzymatic transesterification using commercially available lipases. The crude reaction mixture (84% conversion of ethyl esters), enriched in trimethylolpropane triesters (96% selectivity) was characterized and its properties compared with those of the starting ethyl esters mixture and the trimethylolpropane esters obtained from vegetal sources.

Keywords: bio-lubricants; waste fish oil; transesterification; trimethylolpropane

Abbreviations

ASTM	American Society for Testing and Materials
DE	Diesters
DHA	Docosahexaenoic acid
EPA	Eicosapentaenoic acid
EtONa	Sodium ethoxide
FAs	Fatty Acids
FAEEs	Fatty Acid Ethyl Esters
FAMEs	Fatty Acid Methyl Esters
ISO	International Standards Organization