

Synthesis and characterization of Fatty Hydroxamic Acids from Triacylglycerides

ABSTRACT

In this study, fatty hydroxamic acids (FHAs), which have biological activities as antibiotics and antifungal, have been synthesized via refluxing of triacylglycerides, palm olein, palm stearin or corn oil with hydroxylamine hydrochloride. The products were characterized using the complex formation test of hydroxamic acid group with zinc(I), copper(II) and iron(III), various technique methods including nuclear magnetic resonance (^1H NMR) spectroscopy, Fourier transform infrared (FTIR) spectroscopy and elemental analysis. Parameters that may affect the conversion of oils to FHAs including the effect of reaction time, effect of organic solvent and effect of hydro/oil molar ratio were also investigated in this study. Results of characterization indicate that FHAs were successfully produced from triacylglycerides. The conversion percentages of palm stearin, palm olein and corn oil into their fatty hydroxamic acids are 82, 81 and 78, respectively. Results also showed that hexane is the best organic solvent to produce the FHAs from the three oils used in this study. The optimum reaction time to achieve the maximum conversion percentage of the oils to FHAs was found to be 10 hours for all the three oils, while the optimum molar ratio of hydro/oil was found to be 7:1 for all the different three oils.

Keyword: Hydroxamic acid; Triacylglyceride; Reflux; Fatty hydroxamic acids; Palm ole.