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Abstract: Fusel oil is a by-product of the distillation of ethyl alcohol from the fermentation of molasses and contains mainly C3-C5 alcohols. Acetic acid and butyric acid esters of its major alcohol components have economic value as chemicals for flavor and fragrance manufacturing. This study presents some data regarding the uncatalyzed esterification of fusel oil with acetic acid, propionic acid and butyric acid. The reactions were carried out at two temperatures, i.e., 45^{°C} and under the reflux conditions (80-85^{°C}). The composition of raw fusel oil and the reaction mixtures were determined by gas chromatography. The reaction rate constants for the formation the esters were estimated based on the concentration-time relationships. The results indicated that esterification rate of fusel oil is very slow and, under identical conditions, the rate depends on the reacting acid. The formation rates of butyric acid esters were found to be higher than the those of acetic acid and propionic acid esters. After approximately 6.5 hours of the reaction at 45^{°C}, the estimated maximum production yield of the mixed acetic acid esters was around 19%, propionic acid esters 24% and butyric acid esters 35%. Increasing reaction temperature increased the conversion ratios.

Key Words: fusel oil, esterification, kinetics.

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