



A potentiometric microtitration method for the determination of ethanol residue in biodiesel samples

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A potentiometric microtitration method was developed for the determination of ethanol residue in biodiesel samples. The analysis was established by potentiometry using a graphite pencil as an indicator electrode and an own homemade Ag/AgCl as a reference electrode. The back titration and first derivative titration graph were employed. The reaction was based on a redox reaction of ethanol with the excess amount of acidified potassium dichromate ($K_2Cr_2O_7$) solution. Then, the remaining unreduced $K_2Cr_2O_7$ was titrated with standard iron (II) solution. The effects of electrodeposition time of silver chloride to form Ag/AgCl electrode, diameter of a graphite pencil, concentration of H_2SO_4 , reaction time of ethanol with potassium dichromate and volume of titration were investigated. This developed method was successfully applied for the determination of ethanol residue in biodiesel samples. The percent recoveries were in the range of 85 - 110% and the relative standard deviation (%RSD) was 1.9% (n=10) for 0.1% v/v ethanol. The proposed method had some advantages of reduce chemical consumption, simple operation, low toxic waste, and environmental friendly.

Keywords: Ethanol; Biodiesel; Potentiometric microtitration