CHAPTER V

CONCLUSION

The liquid marker dyes in the series of chloronitroaniline derivatives; octylsalicylate-chloronitrophenyl azo (set B) and the esterified-chloronitrophenyl azo (set C) were used for marking diesel oil at 5 parts-per-million. In the detection procedure, the maximum absorption wavelengths and the 9:1 ratio of oil phase to aqueous phase were used. These base- extractable marker dyes could exhibit their specifically visual colors by the complexations between the marker dyes and the basic aqueous extraction phases. The octylsalicylate-chlorophenyl azo (set B) and the esterified-chlorphenyl azo (set C) were not different in their visual colors because they were composed of the phenolic compounds. The most appropriate solvent extraction system was the mixture of cosolvents; methanol, ethylene glycol and ethylenediamine. It was the basic solution enough for extracting all of marker dyes into the aqueous phase and resulting the intensely and specifically visual colors. The octylsalicylate-2-chloro-4-nitrophenyl azo (marker dye B_1) and the esterified CNSL-2-chloro-4-nitrophenyl azo (marker dye C_1) were exhibited the intense purple and bluish violet which were different from other marker dyes in these series showing the yellowish orange to the orange-red. So they were the most appropriate marker dyes for marking in petroleum fuels. This solvent extraction method was the most convenient to detect the marker dyes because it could show the remarkable absorption at very low dye content in diesel oil. Moreover, the

quantitative determinations could be precisely prepared for detecting the marker dye concentrations, dilutions, adulterations and stability by UV-VIS spectroscopic techniques. Importantly, the storage period of marker dyes in diesel oil had no effect to the marker dye contents at least 3 months.

Suggestion

In accordance with this research, the marker dyes in the series of chloronitroaniline derivatives could be synthesized in laboratory scale, therefore the large scale method should be explored. The novel series of marker dyes should be provided for detecting petroleum fuels in many purposes. The identificaton systems should be easily and unambiguously done by the simplest of field procedure. In the laboratory methods, the marker dyes should be detected by other spectroscopic techniques to confirm the marker dye which were added.