

Quantifying ethanol by HS-GC-FID in peripheral blood of victim

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Introduction

Ethanol in forensic science is very important because justice must know if the victim was under the influence of alcohol when s/he died. For quantifying alcohol the most used technique is gas chromatography (CPG) coupled with detection by ionization of flame (FID). Besides, this technique is acknowledged since the order of March 6th, 1986 as official technique for the lawful determination of ethanol rate.

Experimental Conditions

The preparation of sample to be analysed was: 100µL of terbutanol (internal standard), 1mL of distilled water and 100µL of sample (peripheral blood) were introduced in a thermostated vial. Then the vial was placed in a Headspace to be injected in capillary column chromatography. Furthermore carrier gas (helium 80cm/s) led compounds in the chromatographic column so that they separated. The FID is considered universal for organic compounds; it is the ultimate detector for GC. The compounds which were eluted from the capillary column chromatography and the carrier gas get into the flame of a burner. Besides this detector will destroy organic compounds whose combustion produce ions which were collected by two electrodes. These ions and particles formed a low ion current which was amplified by an electrometer into a measurable voltage by the integrator.

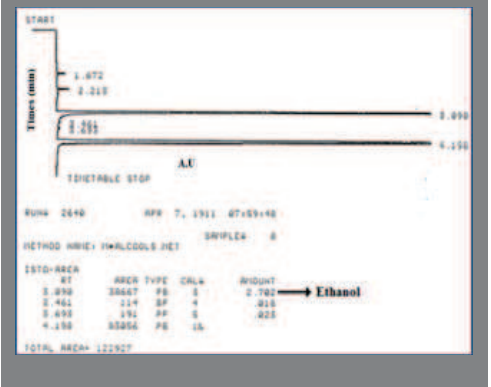
Results and discussion

Figure 1 shows that ethanol was eluted at a retention time of about 3 minutes and the ethanol concentration in the blood of the victim was 2.70 g / L. The peripheral blood was used as a reference for interpretation of results. Presence of a high ethanol concentration in the peripheral blood, confirms that the victim was under the influence of ethanol when s/he died. From a clinical perspective, we must know that ethanol rate between 1.5 g / L and 3 g / L indicates a severe intoxication mainly characterized by visual disturbances (shapes and colors), poor motor coordination, drowsiness and exacerbation of emotional reaction.

Conclusion

The screening of drugs is needed to make a full assessment of victim's toxicology. Consequently judges could better conclude as to the state of the victim when s/he died.

Figure1: Chromatogram of alcohol by HS/GC/FID in peripheral blood



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