



K3 Use of the QED® Saliva Enzymatic Alcohol Test Device for the Identification and Quantitation of Alcohol in Urine

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After attending this presentation, attendees will learn the use of the QED® Saliva Enzymatic Alcohol Test Device for the identification of ethanol in urine and to determine the concentration of ethanol in urine.

Method: The QED® Saliva Alcohol Test (STC Technologies, Inc., Bethlehem, PA 18018) is a rapid enzymatic alcohol dehydrogenase assay which quantitatively measures alcohol concentrations from 0 to 150 mg/dL. We evaluated the QED® A-150 Saliva Alcohol Test Device for the determination of alcohol in urine. We followed the manufacturer's procedure, except that the cotton tip of the swab was dipped into urine so that the cotton swab was saturated with urine. Samples were analyzed on the same day by Gas Chromatography (GC) with flame ionization detector (FID) on a glass column, 1.82 m x 2 mm ID glass column, 60/80 Carbowax B/ 5% Carbowax 20M (Supelco, Bellefonte, PA, 16823). Npropanol (NP) is used as internal standard (IS). Urine samples, which were spiked with ethanol at 20, 40 and 80 mg/dl gave the following average results. Within-run precision by QED® at the 3 concentrations (n=12) was 7.3% with a 128 +/- 31% recovery; between-run precision averaged 11% with 131 +/- 29% recovery. For comparison the average within-run precision by GC at the 3 concentrations (n=12) was 2.9% with a 104 +/- 5% recovery; between-run precision averaged 4% with 103 +/- 3% recovery. Urine samples that were analyzed on the same day by QED® and GC gave the following results. The concentration of samples ranged from 0 to 383 mg/dl of ethanol with a mean of 117.35 and standard deviation (+/-) of 79.01 by GC mean= 117.35 +/- 79.01, n=31) and a mean of 100.09 and standard deviation (+/-) of 65.75 by QED® (mean= 100.09 +/- 65.75, n=31). Least squares analysis of urine alcohols by GC (x) in comparison to QED® (y) gave a slope (m) of 0.929, y-intercept (b) of -1.028 and correlation coefficient (r) of 0.99 ($y = 0.929x - 1.028$, $r = 0.99$) with a standard error of estimate S_{yx} of 14.95. Recovery studies indicate that QED® overestimates urine alcohols at low concentrations. No false positive results were reported by QED®. Interference studies indicate that n-propanol will cross react 60% and isopropanol 20% with the QED alcohol method. We conclude that the QED® saliva method can be used for the determination (identification and quantitation) of alcohol in urine. Although QED does not have the sensitivity, selectivity and precision or accuracy of GC, it will provide qualitative and quantitative results more rapidly than GC, less than 3 minutes.

Urine Alcohol, Gas Chromatography, QED®