

tions may have high acidic or basic activity, or strictly organic properties which are not compatible with autoanalyzer components including syringes, tubing and metal and plastic parts. The buffer also promotes carrier independence. The R2 also contains surfactants that enhance the carrier-free matrix, decrease surface tension, promote effective mixing on a molecular level and improve flow dynamics through tubing and syringes of automated analyzers. The concentration and combination of components of the R1 and/or the R2 reagents can be varied to compensate for limitations and variations in the configuration of sampling and reagent delivery systems of various makes of available autoanalyzers. Without further elaboration, it is believed that one skilled in the art can, using the preceding description, utilize the present invention to its fullest extent. The following preferred specific embodiments are, therefore, to be construed as merely illustrative and not limited to the remainder of the disclosure in any way whatsoever. In the following examples, all instrument parameters, reagent combinations and method techniques are set forth.

EXAMPLE 1

The automated total ketone bodies urinalysis reagent system's first reagent (R1) contains surfactant, 2,3-butanedione monoxime, ethylenediaminetetraacetic acid (sodium salt), dimercaptopropanol, bile salts, Delta-3-hydroxybutyrate dehydrogenase, NAD and buffer. The second reagent R2 consist of surfactant, buffer, 4-nitrobenzene diazonium tetrafluoroborate, ethylenediaminetetraacetic acid (sodium salt), sodium nitroferricyanide, yttrium and phosphoric acid trimorpholide. The reagents are placed on the autoanalyzer. The urine samples, standards and controls are placed in the autoanalyzer specimen cups. The urine samples, standards and controls are aliquoted into cuvettes and mixed with the first reagents The second reagent is added and mixed and the solution is read at specified intervals as dictated by the instrument parameters and at the specified wavelength (monochromatically) depending on reagent combination used. Analyzer temperature is set at 37 degrees C. In this instance, the assay is read at 645 nanometers and read times are specific to the analyzer. NOTE: the result of this assay is equivalent to 99% of total ketone bodies present in the test samples.

EXAMPLE 2

The automated total ketone bodies urinalysis reagent system's single reagent contains, ethylenediaminetetraacetic acid, NAD, Delta-3-hydroxybutyrate hydrogenase, buffers and surfactants. The reagents are placed on the autoanalyzer. The urine samples, standards and controls are placed in the autoanalyzer specimen cups. The urine samples, standards and controls are aliquoted into cuvettes, mixed with the first reagent, and the solution is read at specified intervals as dictated by the instrument parameters and at the specified wavelength (monochromatically) depending on reagent combination used. Analyzer temperature is set at 37 degrees C. In this instance, the assay is read at 340 nanometers and read times are specific to the analyzer. NOTE: the result must be multiplied by 1.25, because this method only measures 80% of the ketone bodies present (B-hydroxybutyric acid).

EXAMPLE 3

The automated total ketone bodies urinalysis reagent system's first reagent (R1) contains surfactants, buffer, NAD and ethylenediaminetetraacetic acid. The second reagent

(R2) consists of buffer, Delta-3-hydroxybutyrate dehydrogenase and surfactants. The reagents are placed in the autoanalyzer. The urine samples, standards and controls are placed in the autoanalyzer specimen cups. The urine samples, standards and controls are aliquoted into cuvettes and mixed with the first reagent. The second reagent is added and mixed and the solution is read at specified intervals as dictated by the instrument parameters and at the specified wavelength (monochromatically) depending on reagent combination used. Analyzer temperature is set at 37 degrees C. In this instance, the assay is read at 340 nanometers and read times are specific to the analyzer. NOTE: the result must be multiplied by 1.25, because this method only measures 80% of the total ketone bodies present (B-hydroxybutyric acid).

EXAMPLE 4

The automated total ketone bodies urinalysis reagent system's first reagent (R1) contains surfactant, ethylenediaminetetraacetic acid (sodium salt), Delta-3-hydroxybutyrate dehydrogenase, glycine and buffer. The second reagent R2 consists of surfactant, buffer, sodium nitroferricyanide. The reagents are placed on the autoanalyzer. The urine samples, standards and controls are placed in the autoanalyzer specimen cups. The urine samples, standards and controls are aliquoted into cuvettes, mixed with the first reagent, the second reagent is added and mixed and the solution is read at specified intervals as dictated by the instrument parameters and at the specified wavelength (monochromatically) depending on reagent combination used. Analyzer temperature is set at 37 degrees C. In this instance, the assay is read at 545 nanometers and read times are specific to the analyzer. NOTE: the result of this assay is equivalent to 99% of total ketone bodies present in test samples.

EXAMPLE 5

The automated total ketone bodies urinalysis reagent system's first reagent (R1) contains surfactant, ethylenediaminetetraacetic acid (sodium salt), Delta-3-hydroxybutyrate dehydrogenase, glycine, NAD and buffer. The second reagent R2 consists of surfactant, buffer, sodium nitroferricyanide. The reagents are placed on the autoanalyzer. The urine samples, standards and controls are placed in the autoanalyzer specimen cups. The urine samples, standards and controls are aliquoted into cuvettes and mixed with the first reagent. The second reagent is added and mixed and the solution is read at specified intervals as dictated by the instrument parameters and at the specified wavelength (monochromatically) depending on reagent combination used. Analyzer temperature is set at 37 degrees C. In this example, the analyzer measures the absorbance after the addition of the first reagent at 340 nm, and calculates the amount of Beta-hydroxybutyric acid (BHBA). After the addition of the second reagent the analyzer again measures the absorbance, but this time at 540 nm, thereby determining the total amount (99%) of the ketone bodies present (i.e., BHBA, and acetoacetic acid, AAA). The analyzer is pre-programmed to report this total, and the ratio of AAA to BHBA. This total and ratio are very important to the attending physician monitoring the progress of a diabetic patient. NOTE: the result of this assay is equivalent to 99% of total ketone bodies present in test samples.

We claim:

1. An automated method for detecting total ketone bodies in a patient's urine sample without employing an impregnated test strip, the steps comprising