Quantitative Analysis of Creatinine

Purpose:
Quantitative analysis of creatinine concentration in human urine is an important method for diagnosing and monitoring renal function. This method can be used to determine the concentration of creatinine in urine, and can evaluate the filtration function of the kidneys based on this concentration.

Introduction:
Creatinine is a metabolite mainly found in muscle tissues, and it is one of the byproducts of muscle metabolism. In muscles, creatinine is converted into creatine through the action of creatine kinase, which is necessary for maintaining high energy phosphate levels in muscles.

Creatinine is primarily excreted from the body through the filtering action of the kidneys and is not reabsorbed by the kidneys. Therefore, the concentration of creatinine in urine is an important indicator of the kidney's filtration function. Under normal circumstances, the production and excretion of creatinine in the body are in a dynamic balance, maintaining a relatively stable concentration in the body. However, when there is excessive production of muscle metabolites or when there is a problem with kidney function, the concentration of creatinine in the body increases.

Therefore, by measuring the concentration of creatinine in urine, the condition of the kidney's filtration function can be understood, and the presence of kidney problems can be determined or the severity of kidney disease can be evaluated. In addition, the measurement of creatinine can also be used to evaluate muscle metabolism, monitor the training effects of athletes, and other aspects.

The normal value(24- hour sample) is 500-2000mg of a day. atients with renal diseases yield an abhormal value. The amount of creatinine could be measured by reacting with picric acid,a method based on Jaffe reaction.

Reagents:

1. 0.75 M NaOH
2. 0.04 M picric acid
3. 20 ppm creatinine

Procedure:

1. Take 2 mL of the original urine of distilled water to dilute it to 50 mL, resulting in a 25-fold diluted urine sample.
2. Prepare 7 tubes and configure the solutions according to the following table,mix. Stand for 15 mins.

	Blank	Calibration curve					Sample
creatinine concentration (ppm)	0	4	8	12	16	20	Sample/25
20 ppm creatinine (ml)	0	1	2	3	4	5	urine sample 1 ml
H_2O	5	4	3	2	1	0	4
0.04 M picric acid (ml)	2	2	2	2	2	2	2
0.75 M NaOH (ml)	2	2	2	2	2	2	2

3. Read absorbance at 500nm, setting the blank at 0Abs.

Results:

	Calibration curve					Sample/25
creatinine concentration (ppm)	4	8	12	16	20	urine sample 1 ml
Abs.						