

Veterinary Electrolyte Test Panel (Seven Test Kits)

For professional and in vitro diagnostic use only.

1 Specification

-1 test/pouch, 10 tests/kit (Cat.no: VE60004)

2 Intended Use

The Veterinary Electrolyte Test Panel (Seven Test Kits) is used in conjunction with Chemistry Analyzer MSC100V and MS200V produced by Zhejiang PushKang Biotechnology Co., Ltd. It is intended for in vitro quantitative determination of the concentration of potassium, calcium, sodium, magnesium, chlorine, carbon dioxide and inorganic phosphorus in anticoagulant plasma or serum.

3 Summary and Explanation of Test

Changes in the concentration of the above 7 substances in the blood are common in water-electrolyte metabolism disorders. Detecting the concentration of these substances in the blood of sick animals is of great significance for the auxiliary diagnosis of related diseases.

4 Applicable instrument

Pushkang Chemistry Analyzer: MSC100V and MS200V.

5 Storage and stability

- This product should be stored at 2~8°C, stable for 12 months. The reagent discs must be used within 30 minutes after the individually sealed packaging bag is opened.
- Do not store in an environment above 30°C.
- The manufacturer date and the expiry date were printed on the labeling.

6 Specimen collection and preparation

- For anticoagulated whole blood, plasma or serum without hemolysis, lithium heparin is recommended for anticoagulation.
- The sample should be tested within 1 hour after collection.
- Venous blood samples must be used.

7 Materials required but not provided

- Pushkang Chemistry Analyzer
MSC100V (Cat.no: VE20001)
MS200V (Cat.no: VE20002)
- Sample transfer tips (type:200μL and 1mL)
- Quality control
Normal
Abnormal

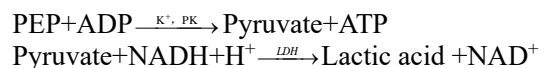
- Diluent

8 Test Principle

This product is based on the principle of spectrophotometry to quantitatively determine the concentration or activity of 7 biochemical indicators in the sample. The reaction principle of each test item is as follows:

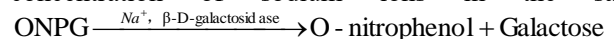
1. Potassium (K⁺), enzymatic method

Phosphoenolpyruvate (PEP) and adenosine diphosphate (ADP) are catalyzed by potassium-dependent pyruvate kinase (PK) to produce pyruvate and adenosine triphosphate. Under the catalysis of lactate dehydrogenase (LDH), pyruvate reacts with NADH to produce lactic acid and NAD⁺. The consumption of NADH in the reaction is proportional to the potassium ion concentration in the sample. Monitor the rate of decrease in absorbance at 340nm to calculate the potassium ion content.



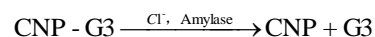
2. Sodium (Na⁺), enzymatic method

O-nitrophenol-β-D-galactosidase (ONPG) is catalyzed by sodium-dependent β-D-galactosidase to produce o-nitrophenol and galactose. The amount of o-nitrophenol produced is directly proportional to the sodium ion concentration in the sample. O-nitrophenol is yellow in an alkaline environment, and the rate of increase in absorbance at 405nm is directly proportional to the concentration of sodium ions in the sample.



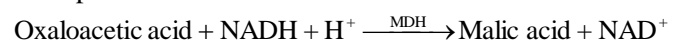
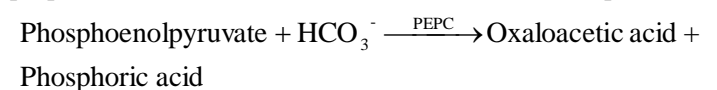
3. Chlorine (Cl⁻), enzymatic method

Chloride ions activate α-amylase to catalyze the decomposition of 2-chloro-4-nitrophenol-maltotriosides (CNP-G3) into maltotriose and 2-chloro-4-nitrophenol (CNP). The latter has an absorption peak at 405nm, and the rate of increase in absorbance is directly proportional to the chloride ion content in the sample.



4. Total carbon dioxide (tCO₂), enzymatic method

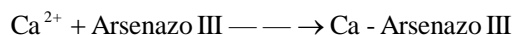
Under the catalysis of phosphoenolpyruvate carboxylase (PEPC), bicarbonate reacts with phosphoenolpyruvate to produce oxaloacetic acid and phosphoric acid. Oxaloacetate is catalyzed by malate dehydrogenase (MDH) to produce malic acid. At the same time NADH is oxidized to NAD⁺. At 340nm, the decrease in absorbance is directly proportional to the carbon dioxide content in the sample.



5. Calcium (Ca²⁺), arsenazo III method

Calcium ions combine with arsenazo III to form a

purple-red chelate, and its color is directly proportional to the calcium ion content in the sample.



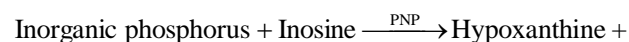
6. Magnesium (Mg²⁺), xylidyl blue method

Magnesium ions combine with xylidyl blue to form a purple-red complex, and its color is directly proportional to the content of magnesium ions in the sample.

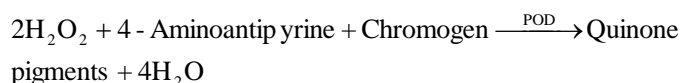
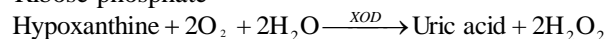


7. Inorganic phosphorus (P), enzymatic method

Inorganic phosphorus (phosphate) reacts with inosine under the action of purine nucleoside phosphorylase (PNP) to produce hypoxanthine. Hypoxanthine is catalyzed by xanthine oxidase (XOD) to produce uric acid and hydrogen peroxide. Under the catalysis of peroxidase (POD), hydrogen peroxide reacts with chromogen substances, and the color is directly proportional to the concentration of inorganic phosphorus.



Ribose phosphate



9 Test Procedure

• Reagent preparation

The reagent panel is lyophilized reagent, for MSC100V the diluent should be manually added before use.

For MS200V the diluent could be added automatically during the use.

• Test condition

The information about the reagent panel can be obtained by scanning the QR code on the package of the reagent panel.

• Operation step

1. The instrument scans the QR code on the reagent panel to read the reagent information.
2. Take the reagent panel out of the sealed bag and place it horizontally. Add 140μL of the sample to be tested (serum, plasma or whole blood) into the sample hole and 750μL of diluent into the diluent hole.
3. Place the reagent panel in the middle of the reagent panel tray of the chemistry analyzer.
4. Operate in accordance with the operating instructions of the instrument. The instrument automatically distributes the sample and diluent in the reagent panel to each reaction well, the lyophilized reagent is dissolved, the reaction starts, and the instrument automatically reads the test result.

Note:

1. The QR code contains the information required for the test, and each batch of products is different. It must be used with the reagent panel of the same batch number, and cannot be mixed, otherwise you will get wrong test

results.

2. If the product's individual package has been damaged before use, or the reagent panel is found to be broken after opening the sealed pouch, it cannot be used for testing, otherwise it may cause abnormal testing process and even damage the instrument. When the reagent panel falls from a high place, it should not be used for testing, regardless of whether or not the panel produces visible broken, in order to avoid more serious accidents.
3. Foreign objects and stains on the surface of the reagent panel may affect the accuracy of the test results. Be especially careful during operation to avoid touching the upper and lower surfaces of the reagent panel. It is recommended to wear powder-free gloves for operation.
4. When adding samples, the tip of the suction head should be inserted into the corresponding liquid filling hole, and then press the pipettor button to ensure that the liquid completely enters the inside of the panel. If liquid sprinkled on the surface of the panel, wipe it with absorbent paper carefully before testing on the machine.
5. The reagent panel should be tested immediately after adding the sample and diluent. Before the reagent panel after sample adding is tested on the machine, excessive tilt and deliberate shaking should be avoided.
6. If the sample and diluent are added in a volume that does not meet the required volume, it may cause an abnormality in the inspection process.
7. In order to avoid cross-contamination, the same suction head should not be reused for absorbing multiple samples, nor can it be mixed for absorbing samples and diluents.
8. You should prepare your own diluent to use this reagent disc. The diluent is purified water. The diluent should avoid prolonged exposure to the air to prevent contamination. It is recommended to use a single package of sterilized water for injection with a smaller dose, ready to use.

• Test result calculation

The built-in calculation function of the instrument can automatically calculate the test results of each item according to the change value of absorbance, and display and/or print them.

• Calibration procedure

1. The Chemistry analyzer is calibrated by manufacturer before shipment. There is a QR code on each reagent disc, which contains calibration information. The user scans the QR code, and the instrument automatically reads the calibration curve information.
2. When changing the batch number of the kit, you should scan the QR code again to read the calibration information. Each laboratory can formulate its own calibration cycle according to the specific situation.
3. When the following situations occur, it is recommended to rescan the calibration information: the batch number of the kit has changed, the quality control value has a

remarkable deviation, and the instrument has undergone major maintenance.

• Quality control procedure

1. Quality control must be performed when the batch number of the kit is changed and the instrument undergoes major maintenance.
2. The control can use Randox's composite chemistry control serum.
3. Each laboratory can set appropriate control limits and quality control cycles according to their own conditions. The quality control value must be within the specified control limits.

If the quality control results are not in line with expectations, it indicates that the test results are unreliable, and a test report should not be issued.

10 Reference Interval

Item	Unit	Group	Reference interval
K ⁺	mmol/L	Dog	Infancy: 3.5~5.5; Adult: 3.5~5.8
		Cat	Infancy: 3.7~5.9; Adult: 3.5~5.8
		Rabbit	3.4~7.5
		Rat	4.7~6.4
		Swine	2.2~7.7
		Monkey	2.7~4.6
		Lizard	/
		Horse	Infancy: 2.4~4.7; Adult: 3~5.3
		Bovine	3.5~5.3
		Sheep	4.2~6.4
		Tortoise	3.7~5.2
Na ⁺	mmol/L	Dog	136~156
		Cat	140~160
		Rabbit	140~156
		Rat	126~182
		Swine	143~157
		Monkey	139~158
		Lizard	/
		Horse	Infancy: 132~146; Adult: 133~150
		Bovine	136~144
		Sheep	143~159
		Tortoise	126~142
Cl ⁻	mmol/L	Dog	105~122
		Cat	112~129
		Rabbit	92~112
		Rat	92~120
		Swine	100~109
		Monkey	98~111
		Lizard	/
		Horse	Infancy: 97~108; Adult: 97~109
		Bovine	99~107
		Sheep	100~113
		Tortoise	83~102










tCO ₂	mmol/L	Dog	14~27
		Cat	13~25
		Rabbit	13~22
		Rat	/
		Swine	/
		Monkey	/
		Lizard	/
		Horse	/
		Bovine	/
		Sheep	/
		Tortoise	/
Ca ²⁺	mmol/L	Dog	Infancy: 1.95~3.15; Adult: 1.98~3
		Cat	Infancy: 1.98~2.83; Adult: 1.95~2.83
		Rabbit	1.4~3
		Rat	1.48~2.35
		Swine	1.63~2.85
		Monkey	2.08~2.53
		Lizard	1.9~2.5
		Horse	Infancy: 2.34~2.96; Adult: 2.6~3.23
		Bovine	2~2.85
		Sheep	2.28~2.7
		Tortoise	2.5~3.63
Mg ²⁺	mmol/L	Dog	Infancy: 0.6~0.95; Adult: 0.68~1.09
		Cat	Infancy: 0.78~1.03; Adult: 0.73~1.35
		Rabbit	0.84~1.45
		Rat	/
		Swine	0.9~3.5
		Monkey	/
		Lizard	/
		Horse	Infancy: 0.58~1.2; Adult: 0.71~1.01
		Bovine	0.6~3
		Sheep	0.96~1.25
		Tortoise	/
P	mmol/L	Dog	Infancy: 1.65~3.35; Adult: 0.81~2.19
		Cat	Infancy: 1.45~3.35; Adult: 1~2.42
		Rabbit	0.39~1.58
		Rat	1.97~3.26
		Swine	1.16~2.97
		Monkey	0.77~2.1
		Lizard	0.61~1.65
		Horse	Infancy: 1.29~2.29; Adult: 0.58~1.81
		Bovine	1.8~3.3
		Sheep	1.29~2.87
		Tortoise	0.74~3.71

11 Warnings and precautions

1. For in vitro diagnosis of animal diseases use only.

2. The reagent discs is a disposable consumable. Do not reuse.
3. The reagent discs that have completed the test may contain pathogenic pathogens and are infectious, and must be disposed of in accordance with the laws and regulations of the place where the test is located.

12 Index of Symbols

	Store between 2-8°C
	Consult instructions for use
	Batch code
	Use-by date
	Contains sufficient for <n> tests
	Do not use if package is damaged
	Do not reuse
	Keep away from sunlight
	Caution

13 Basic information

Manufacturer: Zhejiang PushKang Biotechnology Co., Ltd.

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