

Application of Test Paper Method in Food Analysis and Health Care

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Abstract

Test paper has the characteristics of the scene quickly test pollutants, have been applied in many fields. This paper reviews the research progress in different areas of the test paper method, this paper introduces the test method to test the characteristics of the pollutant effect; At the same time its application in environmental testing method is discussed.

Keywords

Test paper, environment examination, research progress.

1. CURRENT SITUATION AT HOME AND ABROAD

In recent years, With the rapid development of China 's national economy and the progress of science and technology, People's living standards have been constantly improved, Material conditions have been greatly enriched, And living conditions have been constantly improved. How to detect various environmental pollutants quickly and accurately, For the prevention of accidents, It is very important to reduce or eliminate all kinds of potential safety hazards. The conventional instrument analysis method needs a long time to collect samples for environmental pollutants, transport, Handover, The test results can be obtained after laboratory analysis, These methods have high accuracy and detection limit[1], But highly dependent on instruments, High requirements for personnel professionalism, And the operation is tedious and time-consuming, Can not meet the needs of rapid measurement on site. Test paper method is easy to carry, Simple operation, Fast measurement speed and other characteristics, It plays a more and more important role in the field rapid determination. At present, the test paper method has been widely used in food, Water Quality, Agriculture, Health care and other fields, It also plays a role in some other fields.

2. AN OVERVIEW OF THE TEST PAPER METHOD

The method of making test paper is simple, Generally, the developer is mixed into a solution, Dip on paper base, Drying in a proper way, Like natural air drying, Cold air drying, Drying and vacuum drying, etc. During the measurement, the way of contact between the test paper and the tested object is natural diffusion, Pull through, The tested sample drips onto the test paper or directly inserts the test paper into the solution, etc [2]. After the sample contacts the test paper, Chemical reaction on test paper, The color of the test paper changes or generates a high gradient, Then compare it with the standard colorimetric card or scale, Conduct visual qualitative or semi quantitative analysis. Low cost of test paper method, Fast detection speed, And it has certain sensitivity and specificity, Be easy to carry about, Easy operation, The method is reproducible.

2.1. Application of Test Paper Method in Food Analysis

Frequent food safety incidents in China, People are full of suspicion, This phenomenon has seriously suppressed the development of China's food industry[3], Therefore, in the field of food, using the test paper method to determine the content of pollutants quickly can predict the index of food safety, On fighting against illegal crimes in the field of food, It is of great significance to protect people's health.

Ji Shujuan et al.[4] used medium speed filter paper as material for qualitative analysis, Soak the test paper with 4% TTC solution for 40s, Vacuum drying for 60min, Full range operation in dark, TTC test paper for rapid detection of antibiotics in milk was developed. Liu Jian et al.[5] and four national grain quality monitoring institutions, Jointly with two immunochromatography test paper manufacturers, Use rice, Two original samples of maize polluted by aflatoxin B1, A comparative study was made on the determination of aflatoxin B1 in grain by HPLC and immunochromatography, The feasibility of immunochromatography is verified. The results showed that the coincidence rate between immunochromatography and HPLC was over 90.5%; Simple operation of immunochromatography test paper, Detection accuracy, Convenient and fast, It can be used to detect aflatoxin B1 in the field and screen the grain. Cheng Nan et al [6] established a rapid test paper method for the detection of hydrogen peroxide residue in food, With 3mm chromatography filter paper as the carrier, the test paper can detect the residual hydrogen peroxide rapidly and semi quantitatively in 3S, The applicability was verified by the determination of hydrogen peroxide residue in 25 groups of samples. Zhang Jie et al.[7] take slow qualitative filter paper as carrier, N-1 Naphthylethylenediamine hydrochloride as chromogenic agent, PH value is controlled by different amount of p-aminobenzenesulfonic acid, The rapid nitrite test paper for milk and water was developed, The lowest detection limit in milk system is 0.4mg/l, 0.2mg/l in water system, The shelf life can reach 30 days under the condition of 4 °C in dark.

2.2. Application of Test Paper Method in Medical and Health Care

The operation of routine testing methods in the field of medical and health care in China is complicated, High requirements for basic quality of personnel, The application of test paper method makes some kinds of detection in medical and health care easy to use, The lower learning cost and no need for additional auxiliary facilities will promote the development of the test paper method in this field.

Ding Weifang et al.[8] used bovine serum albumin with single component as template virus, Using colloidal gold labeled antiserum (i.e. dalingping immunoglobulin polyclonal antibody) as detection tracer, The BSA and Staphylococcus a proteins were imprinted on the nitrocellulose membrane to make a detection line and a control line respectively, Through a series of process creation and assembly matching, A complete set of test paper for rapid detection of turbot antibody was successfully prepared for the first time. The results showed that the specificity and sensitivity of the test paper were very high, Comparable to ELISA, And easy to use, No need for professional skills and additional reagent auxiliary equipment, The observation results can be obtained with naked eyes within 5 minutes, It is very suitable for grass-roots production operation and outdoor research. He Fangqi[9] and others take a certain specification of chromatography filter paper as the carrier, Improvement of lactose bile culture medium, Add adsorbent to absorb the tested liquid, Uniform integration of improved culture on filter paper (qualitative chromatography filter paper), Dry to test paper under sterile condition, Tedious operation, Consumption of materials and time, Improved formulation and technology of fermentation tube test method with slow results, Paper it, Easy to use, Simple operation, Purpose of rapid detection. The results of this study show that, The coincidence rate between the detection results of fecal coliform in sewage by paper method and that by tube fermentation

method is 97.2%, Basically meet the actual use requirements. Wang Li et al. prepared histamine test paper based on the principle of colorimetry, The color system was screened, The preparation conditions of the test paper method were studied, And the standard colorimetric card was prepared, Comparison with national standard law, Evaluate the test paper. The test paper test results are consistent with the national standard test results, Good reproducibility of data. Xiao g et al [10] established a colloidal gold immunochromatographic method for the rapid detection of clenbuterol hydrochloride (CL) in pig urine and other samples, Preparation of colloidal gold by reduction of chlorogold with trisodium citrate, Label it with anti CL monoclonal antibody, Preparation of gold labeled antibody; CL human serum albumin (HSA) as coating antigen, Making colloidal gold test paper with Goat anti mouse LGG as the second antibody of quality control line, The particle size of colloidal gold was optimized, Parameters such as dosage of labeled antibody and pH value, Finally, the size of colloidal gold was determined to be 15nm, Add 20 μ G antibody per ml of colloidal gold solution, The pH value of colloidal gold solution is 7.4, The gold standard antibody diluent was a 0.05mol/l phosphate buffer solution (pH7.4) added with 0.1% BSA, Spraying amount of gold standard antibody is 50 μ L / cm², The concentrations of cl-hsa and Sheep anti rat LGG were 0.5mg/ml and 2mg/ml respectively, The detection limit of CL colloidal gold test paper is 3ng / ml, And Ractopamine, There was no cross reaction between salbutamol and other six β - stimulants, The results of 42 samples of pig urine were in accordance with the commercial ELISA kit. 100% of the test paper did not need instrument assistance, Simple operation, Can be completed in 5 minutes, Suitable for on-site detection of residues.

3. EXPECTATION

The test paper method is a fast detection method applied in the field, With ease of operation, Low cost, Strong replicability and other characteristics are widely used in the detection of food, water quality, agriculture, medical health and other fields.

a) It is found that the establishment of a new chromogenic agent and a high sensitive chromogenic system provides a better guarantee for the rapid and accurate detection of the test paper method on the spot.

b) Introduction of organic reagents and multicomponent complexes, Enhance the stability time of developer, Extend the shelf life of test paper, Promote the development of photometric analysis.

c) Add proper amount of surfactant, Improve the stability of the reaction, Improve the sensitivity of detection method, Speed up response Enhance the reaction signal between the substance to be tested and the developer.

d) Find the right masking agent, The most possible elimination of interference ions, Improve the accuracy of detection method.

From traditional qualitative or semi quantitative detection to accurate quantitative analysis, It provides a broad development space for the application of test paper method. Develop efficient color system for other testing items, Research and manufacture more test paper with excellent performance, So that in the sensitivity, Detection range, Greater breakthrough and better development prospect in response time.

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