

Labthink Lab and Service-----Organic Vapor Permeability Lab

Abstract: this paper introduced the necessity of aromatic vapor permeability test and its testing method, together with the function and service of organic vapor permeability lab and the organic vapor permeability tests.

Key Words: aromatic vapor, barrier property, permeant amount, NON-FICK permeance, test

Aromatic vapor exists in food, medicine, cosmetic and diverse daily chemical such as flavor snack food, distilled spirit, flavor, chinese traditional medicine, plaster, perfume, fancy soap, shampoo and so on. Different from inorganic gas and water vapor, most aromatic vapor is emitted by products themselves and is key quality and main function of these products(even the sole function). As to these products, the existence of aromatic vapor is comparatively important. Dissipating or adding of aromatic vapor will affect quality and selling of products, so kinds of aromatic vapor and maintain of concentration are important indexes of products quality measurement. However, aromatic vapor permeability test is a difficult problem worldwide all the time. Organic vapor permeability lab of labthink is engaging on test and research of it.

1. Necessity of aromatic vapor permeability test

The odor and aromatic vapor that mentions in this paper, refers to organic vapor of various kinds. And different from routine aromatic compounds, it has close relationship with product quality. Sometimes they are real “products”. As for perfume, refreshing agent and so on, real “product” disappears as aromatic vapor dissipates. As for some medicines, effects lose as plaster smell disappears. Sometimes they are key factors in selling, to flavor snack food, special product, smoke, alcohol and so on. Sometimes they greatly affect sales, to most cosmetics, different smell could affect sales. Products above can not be sold out if aroma disappears, despite their basic functions are maintained perfectly. Further more, these products mentioned above, have a common problem of smell from outside of packages, slightly filter of particular odor may affect smell inside packages, as well as sale and usage of products. So we must choose packaging materials that possess good barrier property of aromatic vapor for these particular odor products to avoid emitting of aromatic vapor and filtering of particular odor.

2 Status of Aromatic Vapor Permeability Test

In the process of aromatic vapor permeates through packaging materials, diffusion coefficient D and solubility coefficient S are affected by permeable matters in polymer, so it is NON-FICK permeance. The most prominent performances are swellings in structure of polymer and other changes of materials because of reaction between permeable matters and polymers. As the time of permeating increases, real permeant amounts separate from predicted FICK curve further and further (but real permeant amounts of FICK permeance fits predicted FICK curve well), as in fig 1.

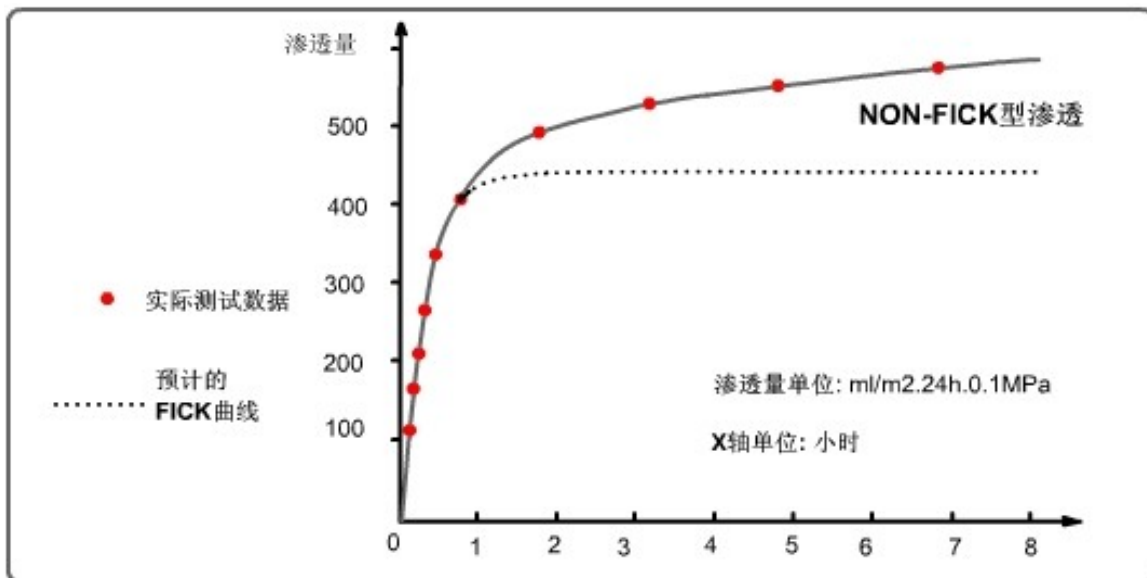


Fig 1 NON-FICK permeance

Aromatic vapor permeability test is applicable to vapor permeability tests of plastic film, sheet and so on. The testing theory is: put specimen into permeant curve which is separated into two parts under certain temperature. One side fills and keeps high concentration aromatic vapor, the other side fills aromatic vapor of low concentration, circulating airflow keeps differential concentration between two sides. Aromatic vapor that permeates through specimen to the side of low concentration, brings away by airflow. Testing system measures the content of aromatic vapor and computes permeant amount of aromatic vapor.

Many other problems may occur during the test of aromatic vapor, for example, the reaction between aromatic vapor and flexible package in permeant process. Compared with gas permeance test and water permeance test, aromatic permeance test involves wider testing areas, such as barrier property tests, macromolecule materials and substance analysis. The aromatic vapor permeability test is more difficult than normal barrier property test in establishment of testing method and development of testing machine. Further more, deep theoretical basis of permeability and plenty experiences of barrier property tests are demanded in research of aromatic vapor permeability and permeant test.

3 Organic Vapor Permeability Lab

At present, with the popularity of barrier property test and enhancement of attentions to products quality from customers and manufactures, there are urgent demands of barrier property test. Among them, the demands of aromatic vapor permeability test are fairly wide, for aromatic vapor may not metamorphose products and affect sanitation indexes, but it is a key factor of selling to many industries such as food, medicine, cosmetic, daily chemical and so on.

Labthink is the foremost international manufacturer of barrier property testing machines of package materials and the first experimentalist of aromatic vapor permeability test. It is experienced in permeability test of routine gases and water vapor. Labthink always regards satisfying customers' needs and enriching advanced technologies as its aim. During the past decades, labthink devoted most of its human resources and material resources to researches of barrier property theories and testing machines. It not only developed series of barrier property test machines, but also got valuable result of data researching. At present, to meet the demands of aromatic vapor permeability test from customers, labthink developed organic vapor permeability tester OPT-01 which could test the permeant amount of organic vapor such as benzenes, esters, alcohols, aldehydes, ketones,

and established organic vapor permeability lab to conduct the researches. The lab tests and services of aromatic vapor permeability, to improve the packages of products that have special demands for odors and control cost of packages by aromatic vapor permeability testing of packaging materials. The organic vapor permeability lab is now undertaking the project of organic vapor permeant amount test with testers developed by labthink and researching and testing permeation mechanism of organic vapor to macromolecule polymer. Available schemes of testing and controlling as well as methods of quality control for packages such as food and cosmetic are expected to derive from the project.

4 Conclusion

The procedure of aromatic vapor permeate to package material is different from that of routine gas and water vapor, however the permeant amount of aromatic vapor can be the key of products selling and there is a rapid increase in aromatic vapor permeability test from market. organic vapor permeability lab of labthink is engaging on researching and testing of aromatic vapor permeability from the very beginning of establishment. It provides services for customers and suggestions of packaging material choosing and structure designing of packages that intend to keep aromatic odor.