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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 22366-2022

Replacing GB/T 22366-2008

**Sensory analysis - Methodology - General guidance for
measuring odour, flavour and taste detection thresholds by a
three-alternative forced-choice(3-AFC)procedure**

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foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules for Standardization Documents" drafting.

This document replaces GB/T 22366-2008 "Methodology of sensory analysis using three-point matching method (3-AFC) for the determination of smell, taste and

General guidelines for flavor perception thresholds, compared with GB/T 22366-2008, except for structural adjustments and editorial changes, the main technical changes as follows.

a) Change the note in "Scope" to the content of the text, and change "Chemical Irritant" to "Stimulus" (see Chapter 1, 2008 edition

Chapter 1);

b) change the terms "stimulus", "test sample" and "three-point matching test" to "stimulus", "test sample" and "three-point forced choice test", and

Modified the definition of "three-point forced choice test" (see 3.1, 3.4 and 3.5, 3.1, 3.4 and 3.5 of the 2008 edition);

c) Changed the content in "Inspection Steps" (see 4.1, 4.1 of the 2008 edition);

d) Deleted the requirement for reviewers to submit results in "Data Processing" (see 4.2 of the 2008 edition);

e) Deleted the item "if the evaluator is familiar with the sample, this deviation can be reduced through intensive training" in "evaluator's training".

Content (see 5.4 of the 2008 edition);

f) Changed the requirements to be observed in the "General Provisions" (see 5.5.1, 5.5.1 of the 2008 edition);

g) Figure 2 "Distribution of population smell thresholds" was changed (see Figure 2, Figure 2 of the 2008 edition);

h) Changed "pd" to "pc" in "Mathematical and statistical models" (see 6.1, 6.1 of the 2008 edition);

i) The content of positive and negative conditions of parameter b has been added (see 6.3.2);

j) Changed the content of "Result Interpretation" (see 6.4, 6.4 of the 2008 edition);

k) Changed the content in "Results and calculations based on maximum likelihood method", (see B.2.3, B.2.3 of the 2008 edition);

l) Changed the content in the table "Initial estimation of step size error limit in threshold estimation" (see Table B.4, Table B.4 of the 2008 edition);

m) Added relevant content on the use of regression models in "Calculation by Linear Regression Method", and changed "log" to "ln" (see B.2.4,

B.2.4 of the 2008 edition);

n) Added the description of B.2 in "Results and calculations" (see B.3.3);

o) Change the comparison of model 3 from "1 and 3" to "2 and 3" (see Table B.6, Table B.6 of the 2008 edition);

p) Change "terpinene" to "pinene" (see B.4, B.4 of the.2008 edition);

q) Change the $\ln(C)$ of "alpha-pinene" and "beta-pinene" when C is 1.000mL/m³ from "-2.30" to "0.00" (see Table B.7,

Table B.7 of the.2008 edition).

This document is equivalent to ISO 13301.2018 "Sensory Analysis Methodology using three-point forced choice method (3-AFC) to measure the sense of smell,

General Guidelines for Taste and Flavor Perception Thresholds.

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

"Threshold" is an important term in sensory analysis and is widely used in sensory studies of food and beverages. Stimulus sensory threshold data

It is often used in two research areas. to measure the sensitivity of an assessor or panel of assessors to a specific stimulus, and to test that a substance elicits sensory

ability to respond. The former is used to judge the appraiser's evaluation level, and the latter is mainly used as a measure of a certain material property.

The term "threshold" was proposed by psychophysicists in the 19th century to indicate the concentration of a stimulus above which the stimulus can be perceived.

Below this concentration, it cannot be detected [see Figure 1a)].

a) Threshold for traditional concepts b) Threshold for probabilistic properties

Description of index number.

X --- stimulating concentration (x);

Y --- Perception probability (pd);

1 --- Threshold.

Figure 1 Thresholds for traditional concepts and probabilistic properties

However, in most cases the relationship between the stimulus concentration and the probability of detection 1) shows an S-shaped curve [Fig. 1b)]. For calculation purposes,

A convenient approach is to assume that the threshold fluctuates, and that a particular stimulus concentration may sometimes be above the threshold and sometimes be below it. therefore

The threshold value can be obtained by estimating the median of these instantaneous

values, that is, the threshold value is the stimulus concentration at which the probability of detection is 0.5. This threshold defines the class

It is similar to the definition of the half-effective amount of chemical substances on organisms in pharmacology, toxicology and other disciplines in biology.

1) This document uses the 3-AFC method to test the stimulus, and the detection probability $p_d = 1.5 \times p_c - 0.5$, where p_c is the probability of making the correct choice. strict

In general, this is a "guessing model" of the evaluator's behavior, not a psychometric model of the evaluator's judgment process. For example, the signal detection model is also applicable, see

Reference [16].

The test results of many laboratories have shown that the detection threshold of a certain substance in water or air can usually range from 2 to 3 or even more.

Many orders of magnitude, well beyond the expected experimental errors or differences caused by data processing (see references [10], [13] and [17]). push

The reason for the test may be related to the differences in the definition of the threshold or the adoption of different testing procedures in each laboratory. Therefore, Devos et al. proposed a

A standardized procedure for detecting detection thresholds in air (see Ref. [10]).

When using this document, it should be noted that the determination of the threshold of perception is not a simple description of appearance, and requires a lot of experimental work. Experimental results

It shows that the individual threshold of the evaluator tends to decrease and the inter-individual differences tend to decrease after repeated tests. The evaluator measured at the threshold

I am not familiar with the test at the beginning of the determination, but with the gradual familiarity with the test samples and inspection procedures, the sensitivity is gradually improved. 3-AFC Method Essentials

Ask the rater to identify the stimulus. Although the training procedure is very cumbersome, it will also provide some required information to the experimenter, such as each evaluator's perceived

Check the concentration range. When the experimenter understands the perceived concentration range of the individual assessors and provides them with an appropriate concentration range, the test results will be

It will be improved, see 6.3.