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Imaging materials - Test method for Arrhenius-type predictions

影像材料 阿累尼乌斯型预测的试验方法

(English Translation)

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Table of Contents

Foreword	
1 Scope	
2 Normative references	
3 Terms and Definitions	
4 Background and Principles	
4.1 Background	
4.2 Principles	
4.3 The Influence of Relative Humidity	
5.1 Overview of the Arrhenius Test	
5.2 Test Requirements	
5.3 Comparison between the sealed bag method and the free-suspension method	
5.4 Effects of heating on photographic film or photographic paper in sealed bags	
5.5 Determination of Sampling Time Interval	
6 Calculations	
7 Test Report	
Appendix A (Informative) Advantages and disadvantages of the sealed bag method and the free-suspension method	
Appendix B (Informative) Limitations of the Arrhenius Method	
B.1 Physical Changes	
B.2 Unrelated physical or chemical reactions	
B.3 Cases exceeding the glass transition temperature of the film-forming material (see 3.3)	
Appendix C (Informative) Several Examples of Arrhenius Relations	
References	

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document adopts ISO 18924:2013 "Test methods for predicting Arrhenius type in image materials".

This document adds a chapter on "Normative References".

--Added notes 1 and 2 to the term "Arrhenius diagram" (see 3.1).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Petroleum and Chemical Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Photosensitive Materials (SAC/TC 102).

1 Scope

This document describes experimental methods for predicting changes in the physical or chemical properties of image materials.

This document applies to the Arrhenius test of ISO 18901, ISO 18905, ISO 18909, ISO 18912 and ISO 18919[1]~[5].

This document applies to predicting increases or decreases in the optical density (D) of image materials. The methods for generating dye-based photographic images include...

Colorimetric development methods, diazo dye generation methods, or non-colorimetric methods (such as dye diffusion methods and silver dye bleaching methods). This document also covers methods derived from the following.

Changes in image density caused by factors.

--Residual colorant in dye-based imaging materials;

--Excessive processing chemicals remaining in silver-plated black-and-white imaging materials;

--The effect of temperature on thermally developed silver images.

This document also applies to predicting the degradation of substrate materials in imaging materials. For example, by measuring the ethyl acetate film degradation produced...

Changes in acid and tensile energy absorption of black and white photographic paper can be used to predict the degradation of the film or paper base.

This document has no normative references.

3 Terms and Definitions

The following terms and definitions apply to this document.

Arrhenius plot

A graph showing the relationship between the logarithm of the time required for a given

change that is characteristically proportional to the reaction rate and the reciprocal of the temperature.

Note 1: The unit of temperature is Kelvin (K).

Note 2: The reaction includes dye loss, changes in tensile strength, yellowing at minimum density (D_{min}), etc.

Note 3: Arrhenius plots can be used to predict the behavior of materials at temperatures lower than the test temperature.

glass transition

Amorphous polymers transition from a highly elastic (or viscous) state to a relatively hard and brittle glassy state, or vice versa.

Reversible changes between them.

glass transition temperature T_g the temperature at approximately the midpoint of the temperature range in which the glass transition occurs.

Note 1: T_g can only be accurately determined by observing the temperature at which a material's specific electrical, mechanical or other physical properties change significantly [6].

Note 2: T_g is also affected by the moisture content of the polymer material (see 5.4, Appendix A and Appendix B, B.3 for relevant information).