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Plastics — Methodology for assessing polymer photoageing by FTIR and UV/visible spectroscopy

*Plastiques — Méthodologie d'évaluation du photovieillissement des
polymères par spectroscopie IRTF et UV/visible*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 10640 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 6, *Ageing, chemical and environmental resistance*.

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Introduction

One of the main interests in the use of artificial accelerated weathering tests is to provide an estimate of the lifetime of polymeric materials exposed in outdoor conditions. This is a very difficult task, and ISO 4892-1^[1] describes some of the reasons why it is difficult and why the use of simple "acceleration factors" relating time in an accelerated test versus time in an outdoor exposure is not recommended without special care.

One way to evaluate whether an artificial accelerated test can predict the relative performance of materials used in outdoor applications is to compare the chemical changes caused by the artificial accelerated test with the chemical changes that occur in outdoor exposure.

Changes in visual appearance (gloss, discoloration, yellowing, bleaching, micro-cracks, etc.) and deterioration in physical (or functional) properties are consequences of chemical changes, even if there is not always a direct relationship between the chemical changes and the mechanical changes. The use of Fourier transform infrared (FTIR) spectroscopy to follow the chemical changes can facilitate the research of correlations between different ageing tests (natural or any kinds of accelerated devices).

This International Standard describes the methodology and a procedure for using FTIR spectroscopy and UV/visible spectroscopy.