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Photocarcinogenesis action spectrum (non-melanoma skin cancers)

Spectre d'action de la photocarcinogenèse (cancers de la peau hors mélanome)

Reference number
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Contents

Page

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Foreword

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ISO/CIE 28077 was prepared by CIE Technical Committee 6-32, *Action Spectrum for Photocarcinogenesis*, as CIE S 019. The committee responsible for this document is ISO/TC 274, *Light and lighting.*

This second edition cancels and replaces the first edition (ISO 28077:2006), of which it constitutes a minor revision.

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Introduction

Solar ultraviolet radiation (UVR) is recognized as a major cause of non-melanoma skin cancer in human beings. Skin cancer occurs most frequently in the most heavily exposed areas and correlates with degree of outdoor exposure. Describing the relationship of exposure (dose) to risk (skin cancer) requires the availability of a biological hazard function or *action spectrum* for photocarcinogenesis. This document proposes the adoption of an action spectrum (weighting function) derived from experimental laboratory data and modified to estimate the non-melanoma tumour response in human skin. The experimental data are sufficient for estimating effectiveness down to about 250 nm, but experimental data are not sufficient for specifying effectiveness above 400 nm.

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Photocarcinogenesis action spectrum (non-melanoma skin cancers)

1 Scope

This document specifies the action spectrum for photocarcinogenesis of non-melanoma skin cancers.

2 Normative references

There are no normative references in this document.

3 Terms, definitions, symbols and abbreviations

For the purposes of this document, the terms and definitions given in CIE S 017/E:2011 and the following terms and definitions, symbols and abbreviations apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1 Terms and definitions

3.1.1
ultraviolet radiation
UVR
radiation for which the wavelengths are shorter than those for visible radiation

Note 1 to entry: The range between 100 nm and 400 nm is commonly subdivided into: UV-A: 315 nm to 400 nm; UV-B: 280 nm to 315 nm; UV-C: 100 nm to 280 nm.

[SOURCE: CIE S 017/E:2011, Term 17-1367, modified —Notes 2 and 3 have been omitted.]

3.2 Symbols and abbreviations

SCUP	Skin Cancer Utrecht-Philadelphia (an action spectrum proposed in Reference [1])
SCUP-m	designates the original SCUP action spectrum, based entirely on mouse data
SCUP-h	designates a proposed action spectrum estimated by correcting for differences in UV transmissions between human and murine epidermis
UV-A1	wavelength range from 340 nm to 400 nm
UV-A2	wavelength range from 315 nm to 340 nm

4 The action spectrum for photocarcinogenesis of non-melanoma skin cancers

The effectiveness of ultraviolet radiation in causing photocarcinogenesis of non-melanoma skin cancers has been studied for many years[1-16]. The action spectrum defined in this document was first published by the CIE as the product of research by CIE Technical Committee 6-32, as CIE 138/2.[16] The document stated the following recognized limitations to this action spectrum:

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