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Acta Medica Iranica
2009;47(4) : 29-35

Original Article

UV-Lamp Intensity Determination Without Use of Radiometer

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Received: October 15,2008
Accept : November 24,2008
Available online: February 28,2009

Abstract:

Background and Objectives: Measurement of light intensity is a recommended practice for insuring the delivery of required germicidal dose in disinfection operations by UV lamps. Use of sensitive to light chemicals which is the base of actionometeric methods could be considered as a suitable manner for estimating the intensity of UV lamp in circumstances that special radiometers are not available.

Materials and Methods: Iodide-iodate mixture was used as an actinometer for this study. The light intensities of a UV lamp (LP 25W) were first determined by a special UVC radiometer at certain distances from the lamp. Then the test of determining the suitable period of time for irradiation of actinometer was accomplished. Finally، the color changes of iodide - iodate solutions at the predetermined distances were evaluated at the wavelength of 352 nm. The latter analysis can be done by a common (visible) spectrophotometer.

Results: Results indicated that use of this actinometer is more suitable at the distances of 35 to 60 cm from the center of the lamp bulb، since iodode-iodate solution has a detectable color change at this range of distance in one minute irradiation which may be considered as a reasonable time for actionmeteric operations.

Conclusion: Although all kinds of actinometers should not be regarded as precise as special radiometers and there would be need to use pure chemicals for actinometeric determination of light intensity، it can be claimed that the recommended procedure in this study which is the newest actinometeric method can be used in acceptable evaluation of UV intensity with least difficulty in providing necessary instruments.

Keywords:

UV lamp ، radiometry ، actinometery ، Iodide-Iodate ، disinfection practices

TUMS ID: 12642

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