

Usage of the Polyphenylene Oxide Dosimeter to Measure Solar UVB and Erythemat UV Exposures over Extended Intervals

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For over thirty years scientists have been using chemical film dosimeters to measure levels of solar ultraviolet radiation (UV) exposure on human subjects in a multitude of different environments, for example on the sporting field or under shade structures. Over this time the most commonly used dosimeter has been the polysulphone dosimeter. The polysulphone dosimeter has proven to be very useful for short term exposure measurements, such as typically over the duration of a single day in subtropical regions. However, the inherently small optical saturation limit of polysulphone does not allow it to be used for long periods of time. Another chemical film dosimeter, the poly 2,6-dimethyl-1,4-phenylene oxide (PPO) film dosimeter has been extensively tested and characterised by researchers at the University of Southern Queensland in order to overcome the limitation of the relatively short dynamic range of polysulphone. Over the period of a year, numerous batches of PPO dosimeters have been calibrated to the solar ultraviolet – B (UVB) (280 to 320 nm) and the erythemat (sun burning) UV in air by employing a scanning spectroradiometer (Bentham Instruments, Reading UK) over the space of a week for each particular batch. Calibrations were obtained in each season in order to ascertain the influence of different solar zenith angle ranges and fluctuations in atmospheric conditions on the PPO film. This presentation will highlight data from this research as well as detail possible applications for the PPO dosimeter for use in health related research.