

Phenothiazine UVA Dosimeter: Characteristics and Performance

Keqin Jia*, Alfio V. Parisi[^] and Michael G. Kimlin*[†]

*AusSun Research Laboratory, Institute of Health and Biomedical Innovation (IHBI),

Faculty of Health, Queensland University of Technology (QUT), Australia

[^]Faculty of Sciences, University of Southern Queensland, Australia

[†]Corresponding Author: Email: m.kimlin@qut.edu.au

ABSTRACT: This paper overviews the characteristics of a phenothiazine-mylar dosimeter which can be used as an effective solar UVA exposure assessment tool. This dosimeter is sensitive to UVA wavelengths (320-400 nm); and its performance has been characterized in a series of tests such as (a) temperature stability of response, (b) impact of long term storage, (c) angular response, (d) spectral response and (e) UVA exposure response (dose-response). There is no effect of long term storage post exposure and no effect of temperature up to approximately 35°. For angles up to 70°, the cosine error of the normalized UVA is less than approximately 0.1. There is a strong and positive correlation ($R > 0.98$) between the ambient UVA exposures measured instrumentally and the UVA dosimeter exposures. These characterizations have confirmed the reliability and reproducibility of a phenothiazine-mylar combined dosimeter as an effective solar UVA exposure tool for field based studies of the UVA exposures to population groups.