

PHOTOACOUSTIC DETECTION AS A METHOD FOR UV-STABILITY ANALYSIS OF POLYSILOXANE-SURFACES

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The influence of UV radiation on crosslinked polysiloxane surfaces was examined by means of photoacoustic detection (Figure 1). Both resins were crosslinked by means of UV irradiation. PS1 was crosslinked by hydrosilylation [1], while PS2 was crosslinked by condensation with hexa-(methoxymethyl) melamine [2]. The ambient air above a surface of PS1 shows volatile compounds in a concentration of 3.8 ± 5.9 ppb, which increases to only 5.8 ± 3.4 ppb during UV irradiation. Hence, polymer degradation cannot be observed. Surfaces of PS2 release VOCs into the ambient air at a concentration of 16.5 ± 9.0 ppb without exposure and of 79.8 ± 34.9 ppb during UV irradiation. Correlation of the measurement intensities of different filters of the photoacoustic detector revealed that methanol was released during UV exposure.

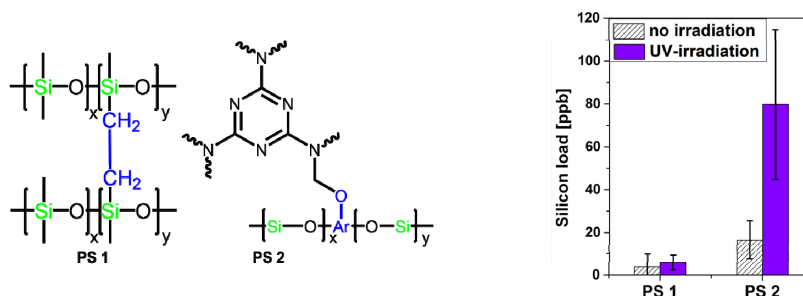


Figure 1: Left: Structures of crosslinked polysiloxanes PS1 and PS2. Right: Siloxane emission from PS1 and PS2 before and during UV exposure for 15 min.

[1] Troegel D., Stohrer J.: Recent advances and actual challenges in late transition metal catalyzed hydrosilylation of olefins from an industrial point of view, *Coordination Chemistry Reviews*, Vol. 255, No. 13-14, 2011, 1440-1459.

[2] Huang Z. Z., Zhang, X. H., Qi, G. R.: Novel halogen-free flame retardant thermoset from a hybrid hexakis (methoxymethyl) melamine/phosphorus-containing epoxy resin cured with phenol formaldehyde novolac. *Express Polymer Letters*, Vol. 3, No. 12, 2009, 788-796.