

## Photothermal and Chromatographic Monitoring of the Photodegradation of Vitamin C

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L-ascorbic acid is a water-soluble vitamin, known as vitamin C, which plays an important role as antioxidant in humans due to its ability to reduce chemicals like free radicals avoiding that other vital molecules can be oxidized during the normal or pathological cell functioning. This ability of vitamin C has been used to perform spectrometric techniques to quantify its concentration by reducing colored chemicals giving an uncolored compound. One of these compounds is methylene blue, which is a water-soluble dye. The reaction of methylene blue with L-ascorbic acid produces a colorless hydrogenated molecule leucomethylene blue. Therefore, this reaction permits to quantify the vitamin C by spectrometric techniques in low absorption coefficient samples. The objective of the present work was to compare the utility of UV-vis spectroscopy versus the thermal lens spectroscopy to monitor the photodegradation process of vitamin C induced by visible or UV light, as well as the production of the degraded products measured by HPLC. In this work, the photodegradation process of vitamin C was studied using a fixed concentration of vitamin C dissolved in HPLC grade water. Samples of vitamin C were illuminated with visible, UVA or UVB light, while an additional group of samples were kept in dark. Several aliquots were taken at different times during the illumination period and for samples kept in dark to monitor the photodegradation process. This event was studied using UV-vis spectroscopy and the potential of thermal lens spectroscopy by adding the aliquots to a fixed concentration of methylene blue previous to the measure. Otherwise, quantification of the main degraded products of vitamin C were measured by HPLC.