

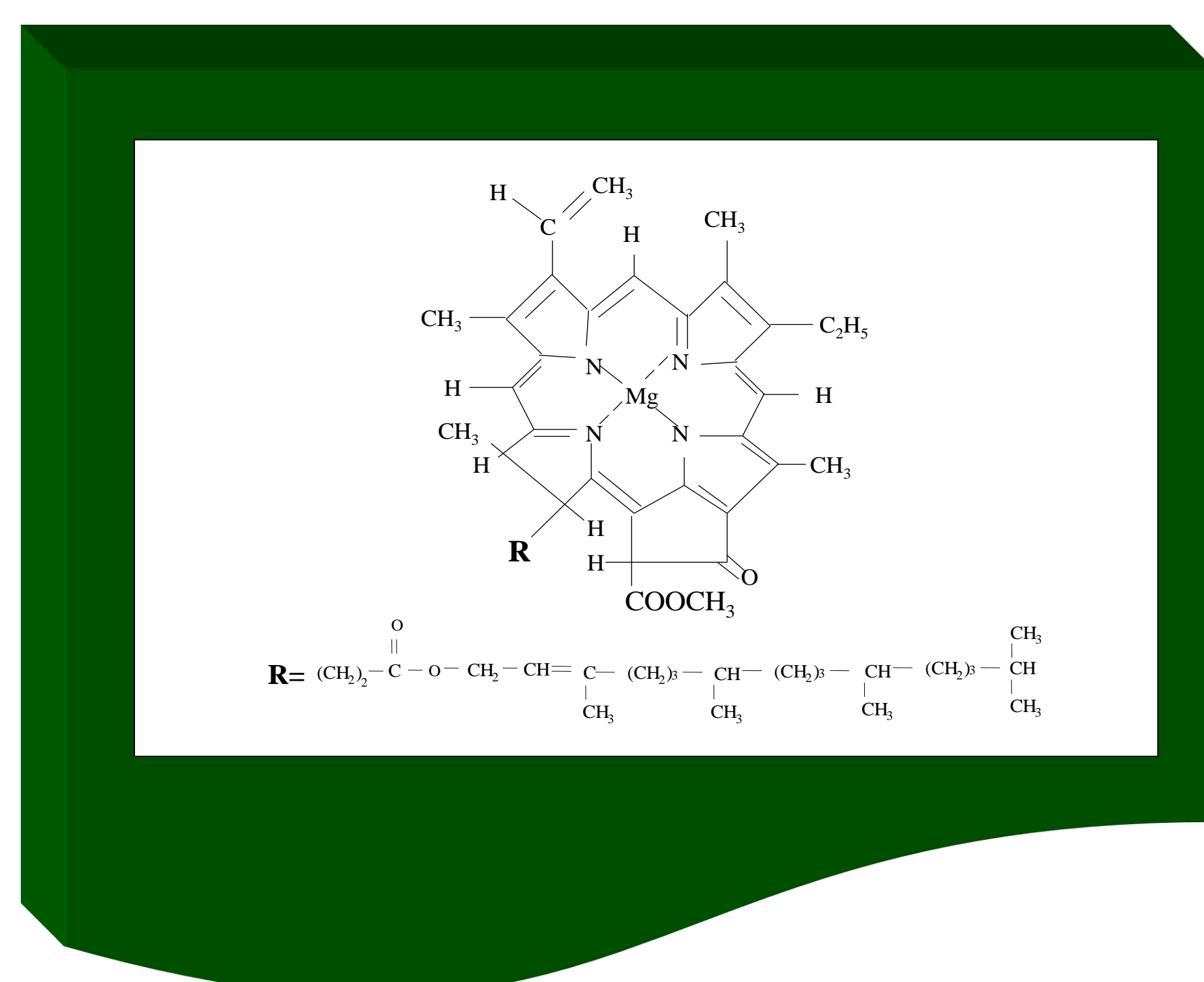
# OPTICAL LIMITATION AND PHOTODEGRADATION IN CHLOROPHYLL A SOLUTION

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## Abstract

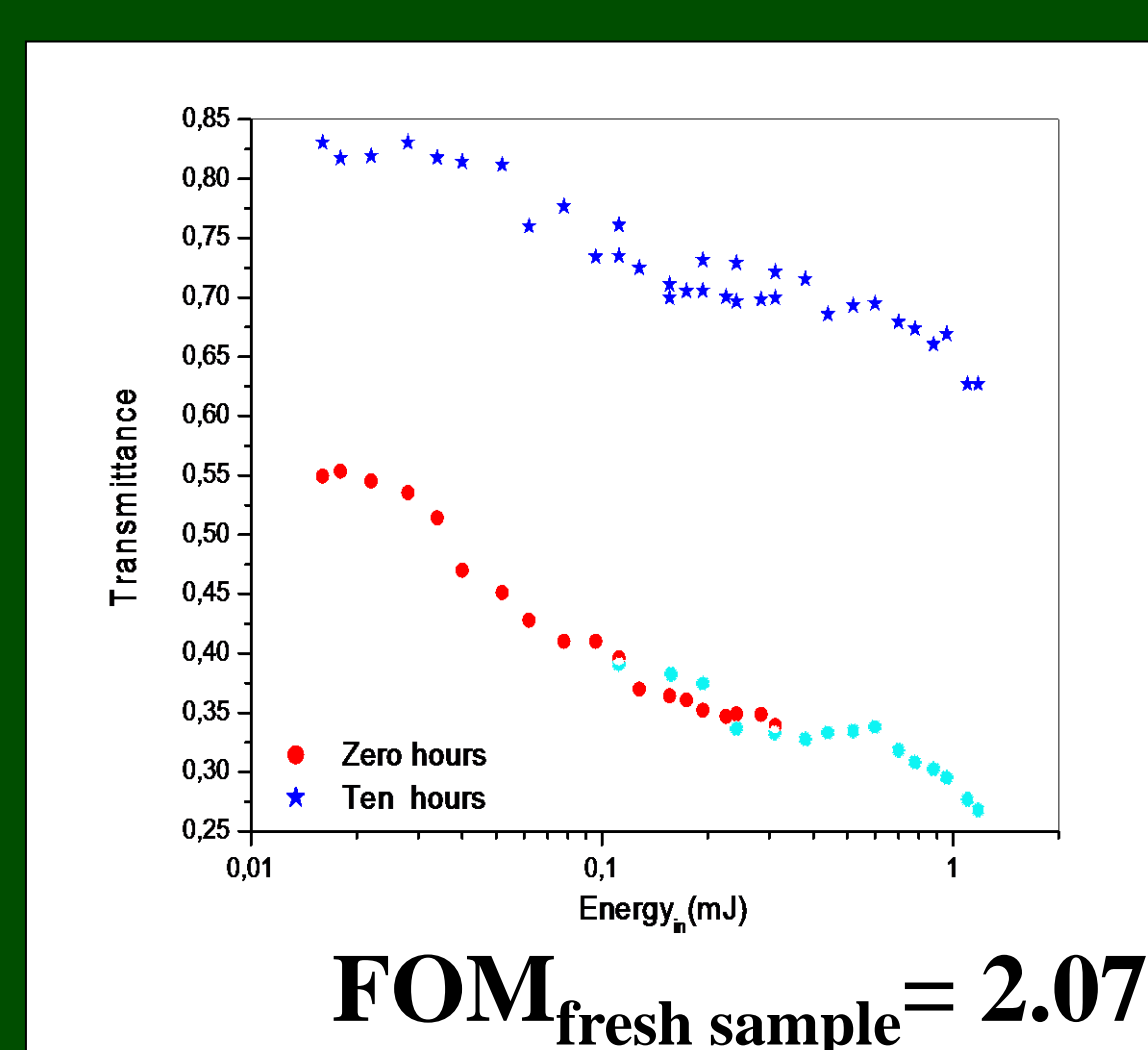
In this work, Chlorophyll A is tested as a possible candidate for optical limiting device, due their reverse saturable absorption process. The optical limitation experiment were performed at 532 nm for 10 ns laser pulses, operating a 5 Hz of repetition rate. We also observed a induced photodegradation process after sample was illuminated by a 532nm CW laser radiation, which was mapping by absorbance spectra. This photodegradation process show to be deleterious for RSA optical limiting behavior of Chlorophyll.

## 1 - The chlorophyll molecule

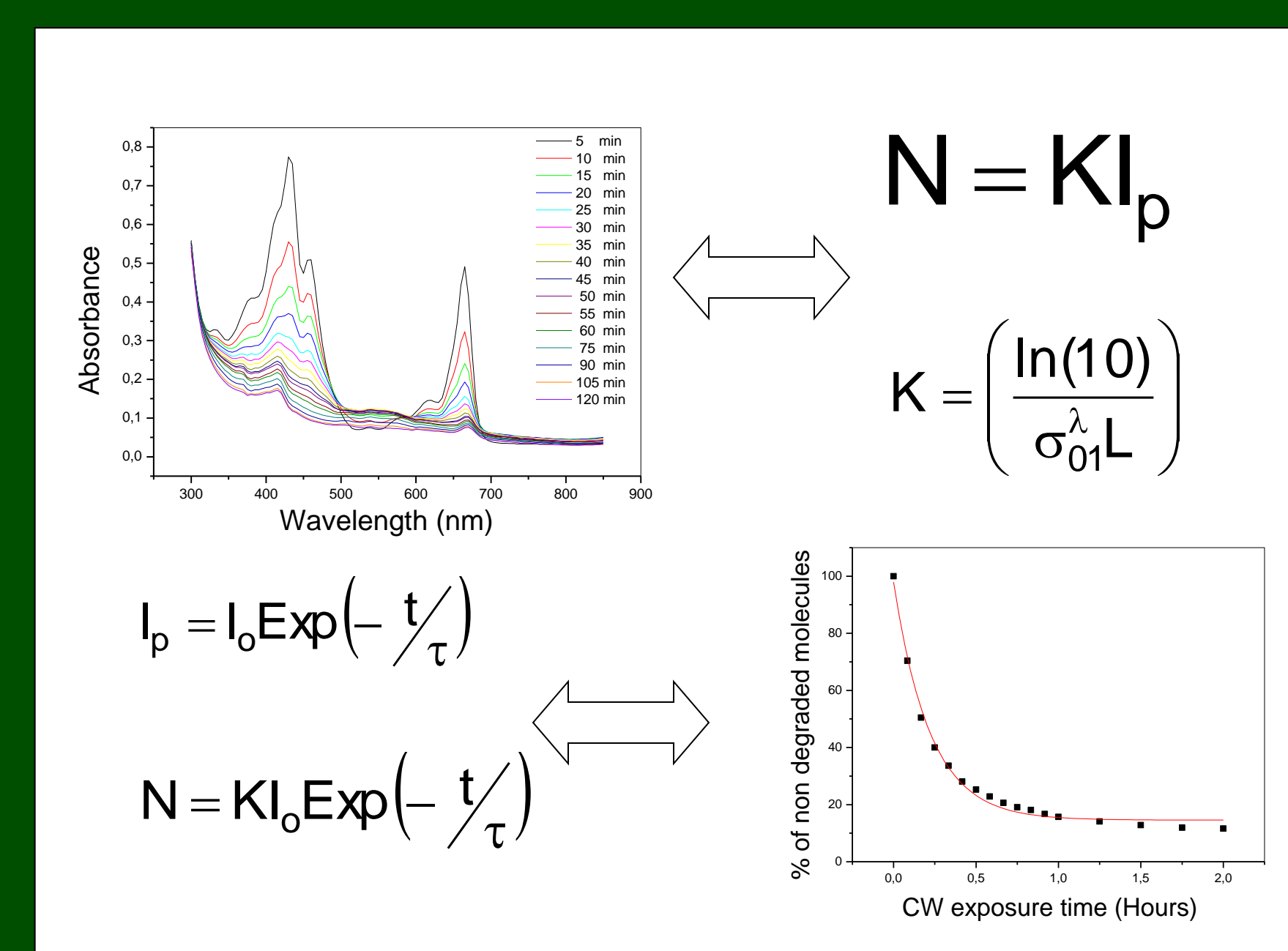


## 2 - Results

### 2a - Optical limiting



### 2b - Photodegradation Process



## 3 - Conclusions

In this work we observed a photodegradation of chlorophyll A chloroform solution upon intense 532 nm light irradiation. It was observed an exponential decay of the molecular concentration with the irradiation time. The origin of the optical limiting effect observed for the chlorophyll solution was investigated by performing measurements at several degradation stages. The decrease in the figure of merit with the photodegradation indicates that the limitation observed is not exclusively related to the ASR process. Other factors, such as, scattering arising from photodegradation and cavity bubbles formation could contribute to the optical limiting. Finally, we conclude to that photodegradation is deleterious for optical limiting applications with chlorophyll, decreasing the figure of merit value.

### 2c - Figure of Merit behavior

