

DETECTION OF H/D EXCHANGEABLE SITES OF CHLOROPHYLL C₁/C₂ IN THE ACRYLATE MOIETY OF THE FUcoxANTHIN-CHLOROPHYLL A/C-BINDING PROTEINS (FCPS) OF THE MARINE DIATOM FRAGILARIOPSIS SP**C. Andreou¹ and C. Varotsis^{1*}**¹Department of Chemical Engineering, Cyprus University of Technology, Limassol, Cyprus(*c.varotsis@cut.ac.cy)**ABSTRACT**

We report pH/pD-dependent Fluorescence-excitation spectra of the light-harvesting Fucoxanthin-Chlorophyll *a/c*-binding proteins (FCPs) of the Marine Diatom *Fragilariopsis sp.* There is a reversible pH and pD 451 to 455 nm Soret transition accompanied by a 588 to 586 nm Qx transition of Chls *c₁/c₂* in the pH/pD 4.9-8 range with a pK_a =5.4, and from the pH/pD dependent Fluorescence-excitation spectra, the H/D exchangeable deprotonation of the 17-acrylate group of Chls *c₁/c₂* was determined. The pH/pD sensitivity of the deprotonated 17-acrylate suggests that the Chls *c₁/c₂*-acrylate-H₂O moiety can act as a proton acceptor site. The observed decrease in the energy transfer efficiency from Chls *c₁/c₂* to Chl *a* under acidic conditions is coupled to the protonation of the 17-acrylates. We present a model that describes an open and a closed form of the protonated/deprotonated Chls *c₁/c₂*-acrylate-H₂O moiety. We suggest that the reversible transition with a pK_a=5.4 controls the switch of the FCPS from light-harvesting to energy-quenching state at acidic pH conditions via exchangeable proton sites.

KEYWORDS: Photosynthesis, Photoprotection, Photosynthetic pigments, Fluorescence spectroscopy**REFERENCES**

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