

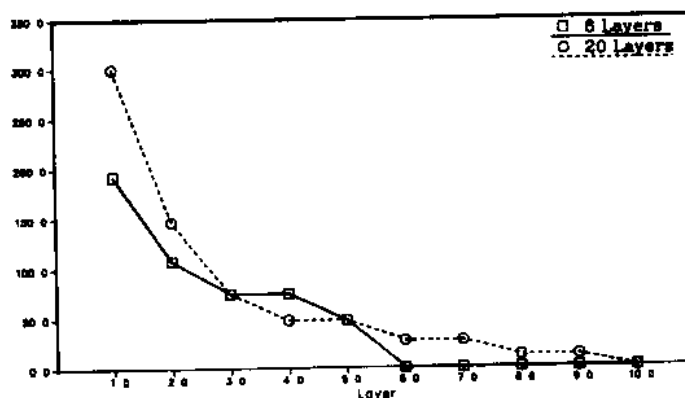
HIID of Organics - Calculations and Chlorophyll-a Measurements*

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1 Theory of the desorption process

The three steps we assume for the desorption process are an initial strong excitation of the electron system, production of molecular forces by interaction with electrons and finally molecular motion. Presently we still use a quite rough approximation for the electron excitation state resulting from the interaction with a heavy ion, which has been described elsewhere [1]. The production of molecular forces from electron excitation is modeled as in the above paper. The context allows also a comparison to other models such as the model of Sundqvist and Williams [2]. The resulting molecular motion is calculated iteratively by direct evaluation of the Hamilton equations of motion.

Figure 1: Differential plot of the yield contributions from different layers for samples with 6 and 20 layers.



By our calculations we obtain "differential" information about yield contributions from single layers in the sample besides spectra of molecular excitation and velocity [3]. They reproduce the "conical shape" of the hole which is left at the end of the process and which has also been found in Experiments [4].

2 Two different sample application techniques with chlorophyll a

In the newly founded Institute for Chemistry and Biology of the Marine Environment at our university a 252-californium PDMS instrument has been built by the group of K. Wien using the new multi-stop converter of the CNRS. Chlorophyll-a spectra were taken for testing different sample application techniques.

The samples were prepared either by evaporation of a drop of a 10^{-3} M n-octane solution directly on an aluminium foil or by adsorption onto a nitrocellulose film. At this concentration of Chl-a in hydrocarbons a large amount of self-aggregated dimers

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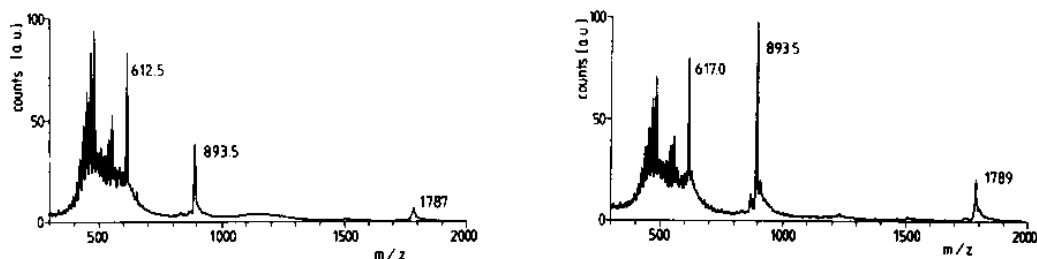


Figure 2: PDMS spectra of Chl a evaporated on an Al foil (left) and adsorbed to Nitrocellulose (right)

is equilibrated. These dimers are well-known in studies on in-vitro models of primary reactions of photosynthesis in green plants [5].

The PDMS positive ion spectra are shown in fig.2. Recording time was 30 minutes. Both spectra show the prominent monomer line at $m/z = 893.5$ amu. Also the dimer line at $m/z = 1787$ or 1789 can be seen very clearly. The lines in the mass region 350 - 650 amu are due to fragments of the Chl a monomer and were investigated extensively in the last years [6]. Fragments of the dimer appear in the 1100 - 1700 amu region.

In comparison a less amount of fragments with the nitrocellulose sample is obvious indicating a less average internal energy of ions desorbed from nitrocellulose [7]. Thus this backing should be preferred in the analyses of multi-component systems

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