

DIFFERENT UREA STOICHIOMETRIES BETWEEN THE DISSOCIATION AND DENATURATION OF TOBACCO MOSAIC VIRUS AS PROBED BY HYDROSTATIC PRESSURE

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Viruses are very efficient self-assembly structures, but little is understood about the thermodynamics governing their directed assembly. At higher levels of pressure or when pressure is combined with urea, denaturation occurs. These processes can be measured considering the decrease of light scattering of a viral solution due to the dissociation process, and the red shift of the fluorescence emission spectra, that occurs with the denaturation process. We determined the urea stoichiometry considering the equilibrium reaction of TMV dissociation and subunit denaturation, which furnished, respectively, 1.53 and 11.1 mol of urea/mol of TMV subunit. Gel filtration HPLC, electron microscopy and circular dichroism confirmed the dissociation and denaturation processes. The calculation of stoichiometry of several other viruses based on spectroscopic results from earlier papers showed that dissociation and denaturation processes follow similar stoichiometries, suggesting a similar virus-urea interaction among these systems.

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