

Physical Studies of Hemocyanins. IV. Oxygen-Linked Disassociation of *Loligo pealei* Hemocyanin*

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ABSTRACT: The 59S hemocyanin from the squid can be disassociated into 19S and 11S subunits in alkaline solution. We now find that such disassociation also occurs near pH 7, if the hemocyanin is partially oxygenated. The deoxyhemocyanin remains in the 59S form from pH 6 to 10, in buffers containing 0.01 M Mg^{2+} . Solutions equilibrated with air or pure oxygen exhibit disassociation at intermediate pH values. The disassociation is a function of the per cent oxygenation. At about 80% oxygenation only the subunits are observed;

higher oxygenation leads to reassociation. That these are equilibrium phenomena is demonstrated by kinetic experiments, in which the same mixture of species is approached from different initial conditions. Sedimentation with ultraviolet scanning indicates that the disassociated subunits bind more oxygen than the 59S hemocyanin, at least at low oxygenation levels. The deoxy and oxy 59S species differ slightly in sedimentation coefficient and in the circular dichroism spectrum in the neighborhood of 250–280 nm.