

CHEM-342 INTRODUCTION TO BIOCHEMISTRY

Abstract for Stokes' article as he might have written it.

"On the Reduction and Oxidation of the Colouring Matter of the Blood"

Abstract The colouring matter of blood in the presence of oxygen is red (scarlet cruorine). Reducing agents such as protochloride of tin or protosulphate of iron in alkaline solution convert scarlet cruorine to purple cruorine. The dramatic spectral changes that correspond to this reversible reaction can be observed easily with a spectroscope. I propose that this reaction corresponds to reactions that occur normally in the blood where scarlet cruorine forms upon reaction with oxygen in the lungs and purple cruorine forms in the presence of unidentified reducing agents in the tissues. A mixture of scarlet and purple cruorine occurs in the veins. Carbonic acid causes the formation of purple cruorine in a reaction that mimics the action of reducing agents in that it removes oxygen from scarlet cruorine. Heat, acidification, or organic solvents irreversibly decompose cruorine into a brown, ether-soluble substance (hæmatin) and a colourless, albuminous precipitate that remains in the acidified water extract. In alkaline solutions hæmatin is soluble and undergoes reversible oxidation and reduction. The spectral changes of this reaction are distinct from those of cruorine.