Serum Protein Determinations of Nanoliter Samples

by

John Werner Viets

Abstract

Two fluorogenic reagents, fluorescamine and o-phthalaldehyde have recently been used to measure nanogram amounts of protein and amino acids. Fluorophors are obtained upon the interaction of these reagents and primary amine groups. In this study fluorimetric procedures were developed to permit measurement of protein concentrations in nanoliter serum samples. The sensitivity of fluorescamine and orthophthalaldehyde detection was found to be similar, whereas the latter assay is more precise. With either reagent it was possible to measure accurately the serum protein concentration in 5 nl serum samples by using a serum standard. The fluorescence of individual serum proteins was found to vary to a marked degree. Albumin, present in rat serum as 50% of the total protein, contributed approximately 60% of the total serum protein fluorescence. Non-protein species in serum do not fluoresce to any appreciable extent with either reagent.

Thesis Supervisor: William M. Deen
Title: Assistant Professor of Chemical Engineering