ABSTRACT

Fluorescence quenching studies were performed on a human serum albumin-quercetin complex by adding three divalent different metal ions (Cu(II), Ni(II) and Mn(II)) to form a tertiary complex. Upon binding to human serum albumin, quercetin fluoresces after excitation at 295 or 450 nm. Two different quercetin moieties in the HSA-quercetin were observed to fluoresce, namely QC1 and QC2. The band shape of the QC1 emission peak was relatively sensitive to the nature of the quencher and the temperature. In constrast, the emission band of QC2 was not shifted upon changing the temperature, but was shifted if tryptophan and tyrosine emission were quenched. The divalent metal ions acted as quenchers for both QC1 and QC2 emissions. Results were analyzed using the Stern-Volmer relationship by plotting the relative intensity vs. the quencher concentration. From the Stern-Volmer plots, QC1 and QC2 emission peaks were seen to be quenched by collisional quenching, with a minor contribution due to static quenching in the presence of Cu(II). When Mn(II) was added to the complex, QC1 was quenched by collision while QC2 was quenched by the combination of both quenching mechanisms, although collisional quenching was the dominant mechanism. In the case of QC2 quenching by Ni(II), the interpretation of the Stern-Volmer relationship was difficult since changing the temperature did not alter the ratio of the fluorescence intensity in the absence and presence of the quencher (F_0/F) from the original temperature. Even though the change was small in the Stern-Volmer plots, it can be stated that QC2 emission band is possibly due to the complex formation with Ni(II).