

Spectral properties of water-soluble melanines

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Melanins are a class of organic compounds that act as pigments in living organisms. Melanins also play an important role in the human body. In particular, they protect tissues from the harmful effects of ultraviolet and other types of ionizing radiation as well as other aggressive carcinogens.

Melanins are pi-electron systems that absorb and emit light in the ultraviolet and visible spectral region. At the same time, the nature of absorption and emission centers in melanins has not been established so far.

The aim of the study was to investigate the spectral properties of water-soluble melanins of plant origin (isolated from black fungi collected in Antarctica and from black tea) to elucidate the nature of optical absorption and emission centers.

It was found that the optical density of aqueous solutions of melanin decreases monotonically with increasing wavelength.

The fluorescence and phosphorescence spectra of aqueous melanin solutions consist of several bands with different excitation spectra.

Low-temperature long-lived luminescence of melanins is characterized by large decay times (hundreds of milliseconds). The close position of the band peaks of low-temperature fluorescence and long-lived luminescence was also established.

The spectral range of absorption as well as the low intensity of fluorescence make melanins promising for their further studies as components of complex nanosystems for photoacoustics and photothermal therapy.

Topics

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