Effect of Temperature on Energy Structure of Emission Centres in Solutions with Silver Complexes

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In our work, the study of spectral characteristics of silver complexes in concentrated solutions of haloid and oxygen-containing salts are carried out in the temperature region of 4.2 - 290 K.

The absorption spectra (77 - 290 K) and emission spectra (77 - 150 K) of the solutions activated Ag^+ are slightly shifted (2 - 7nm) in a short-wave region. It is established that at lowering the temperature from 77 down to 4.2 K in the emission spectra of explored solutions of bromides with an impurity Ag^+, as well as for the solutions of chloride salts activated with Ag^+, the essential diminution of half-widths of luminescence bands (in 1.5 - 4 times) and the considerable shift of maxima of emission spectra in the short-wave region, and a clear appearance of structure of emission and photoexcitation bands are observed.

It is found that the temperature shifts of emission bands of the solutions activated with Ag^+ are closely bound with a quantum yield of emission. At increasing the temperature from 77 up to 150 K for all investigated solutions, the diminution of a quantum yield emission is observed. It is revealed, that the ν_{max} and σ - half-widths of emission bands depend on a wavelength of excitation light in all temperature region of the investigation.

It is elucidated, that the emission centres in solutions activated with silver are less stable than in crystals. This fact is confirmed by the smaller value of an activation energy *Q* of nonradiative transitions and a luminescence quenching constant *C* for solutions in comparison with ones for crystalline phosphors of the same composition.