

**SYNTHESIS AND LUMINESCENCE OF SILVER(I) COMPLEXES
WITH POLYDENTATE PYRIMIDINE LIGANDS**

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Designing coordination compounds with luminescent properties is a promising task due to applications of these compounds in organic light emitting diodes (OLED). Synthesis and luminescence study of silver(I) complexes is of current interest in modern coordination chemistry because bright fluorescence and phosphorescence of silver(I) complexes have been published. Emission of the complexes has been observed in visible and ultraviolet areas. In the present research we use pyrimidine-based ligands (L^n) to synthesize Ag(I) complexes (Fig. 1). Coordination of π -deficient pyrimidine ligands to silver(I) ion may increase the photostability of these complexes. The various substituents in the pyrimidine ring significantly influence on the coordination modes of pyrimidine-based ligands, forming mononuclear and polynuclear silver(I) complexes.

The purpose of the work is synthesis of Ag(I) complexes with polydentate pyrimidine ligands and study of their luminescence. A series of coordination compounds, $[AgL^1NO_3]$, $[AgL^1X]_n$ ($X = I^-, Br^-$), $[AgL^1(PPh_3)Y]$ ($Y = CF_3SO_3^-, BF_4^-, NO_3^-$), $[Ag_2(L^2)_2Z_2]$ ($Z = I, Br, Cl$), $[AgL^3NO_3 \cdot CH_3CN]_n$, have been synthesized. According to the X-ray single data, the complexes $[AgL^1NO_3]$, $[AgL^1(PPh_3)Y]$ adopt mononuclear structures; the complexes $[Ag_2(L^2)_2Z_2]$ are binuclear; $[AgL^1X]_n$ and $[AgL^3NO_3 \cdot CH_3CN]_n$ are polymeric compounds. The silver(I) complexes exhibit photoluminescence in blue, green and red regions of the visible spectrum in the solid state. The complex $[AgL^1(PPh_3)CF_3SO_3]$ shows temperature and excitation wavelength dependent emission (Fig. 2). This complex demonstrates a phosphorescence band at 400–600 nm with a vibronic satellite structure. The lifetimes of the excited states are 0.8 and 27 ms. There is a bathochromic shift of the emission band upon decrease of temperature from 300 K to 77 K. The complex is photostable at ultraviolet radiation for a long time.

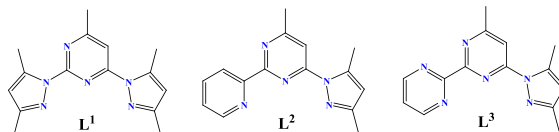


Fig. 1. Polydentate pyrimidine-based ligands

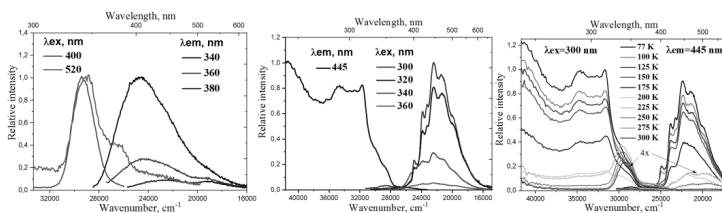


Fig. 2. Luminescence of $[AgL^1(PPh_3)CF_3SO_3]$ at 300 K (left); at 77 K (middle); at different temperatures (right)

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