V. Stretovich, Student, N. Smyk, PhD, nsmyk@chem.univ.kiev.ua,
R. Linnik, PhD, O. Zaporozhets, Dr. Sci.
Taras Shevchenko National University of Kyiv, Kyiv

1-(2-THIASOLYLAZO)-2-NAPHTOL AS A LUMINESCENCE REAGENT FOR HEAVY METAL DETERMINATION

The fluorescence properties of 1-(2- thiasolylazo)-2-naphtol in solution and immobilized silica surface were studied. I was found that peak position in fluorescence spectrum depends upon the dominant protholitic form of reagent: the peak of the emission spectrum of the anionic form is observed at λ = 535 nm, molecular form – at λ = 350 nm, anionic form – at λ = 430 nm. The fluorescence intensity of the reagent molecular form in aqua:ethanol (1:20) at a pH of 6,0 ± 0,3 increases linearly with it concentration up to 5.10^{-5} mol / L. The fluorescent spectra indicate that reagent is luminescent in both the aqua-ethanol solution and on the silica surface. The differences between the peaks position in the fluorescence spectra of different protolytic forms of 1-(2-thiazolylazo)-2-naphthol immobilized are saved. The emission spectrum of immobilized reagent shifts to longer wavelengths (Δλ = 50 nm) in comparison with the fluorescence spectrum of solutions. This fact can be caused by polarizing effect silica surface as protogenic polar solvents do. The influence of some heavy metal ions on fluorescence of 1-(2-thiasolylazo)-2-naphtol in solution and immobilized on silica surface have been studied. It was found that complexes of Cu (II) and Zn (II) with the ratio metal:reagent 1:1 are fluorescent in solution and on the silica surface. The fluorescence intensity increases in the presence of Cu (II) and Zn (II). Thus, the application of 1- (2-thiazolylazo) -2-naphthol for the sorption-fluorescence determination of ions Cu (II) and Zn (II) ions is a promising. The hyphenation sorption-fluorescence method for Cu(II) and Zn(II) determination was worked out. This method is two times more sensitive than sorption-spectroscopic one.

Keywords: 1-(2- thiasolylazo)-2-naphtol, sorption, silica, fluorescence.