

# Luminescent Determination of Copper, Silver and Gold Using Unithiol in Solution and Immobilized on Silica Surface Modified with Polyhexamethylene Guanidine

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*Sodium 2,3-dimercapto-1-propanesulfonate (unithiol) which forms complexes with copper(I), silver(I) and gold(I) with intense luminescence at 77 K was used for low-temperature luminescent determination of copper, silver and gold. Sorbent obtained by consecutively modification of silica with polyhexamethylene guanidine and unithiol quantitatively extracts copper(II), silver(I) and gold(III) in the pH range of 1–8. The luminescence-excitation and luminescence-emission spectra of copper(I), silver(I) and gold (I) complexes with unithiol, including the last bounded to the silica surface, are located in the range 200–350 nm and 500–700 nm, respectively. The methods of luminescent determination in solutions and sorption-luminescent determination of copper, silver and gold were developed. Sorption preconcentration and subsequent luminescent determination of components in the solid sorbent phase allow to reduce their limits of detection tenfold. Luminescent determination in solutions and sorption-luminescent determination techniques were used to determine copper in natural and technogenic waters and gold in gold-containing flotation concentrate.*

**Keywords:** modified silica, polyhexamethylene guanidine, unithiol, luminescence, copper, silver, gold