The distribution of gold and its pathfinders in loose sediments of gold ore occurrence Piilola(Finland)

V.A. KORSHUNOVA[1*], A.V. SERGEEV[1]

[1] Saint-Petersburg State University, Russia
(*correspondence: v.korshunova@spbu.ru)

Prospecting for gold deposits are often based on the using of its pathfinders, but in choosing elements as indicators of gold mineralization is necessary to consider not only the genetic relationship between the elements in primary halos, but also their migration features at scattering in secondary halos, and, consiquently, pay attention to study the element mobile forms.

Using of sequential extraction method allowed to reveal the main mobile forms of gold and its pathfinders(As, Cu, Ni) in loose sediments (podzol soil, ground moraine) overlying the gold ore occurrence Piilola (Finland). It was found, that the main mobile form of Au is a form bound to organic matter in soil, and water-soluble, weakly and strongly adsorbed in ground moraine. For As, Cu, Ni the main mobile form is a form bound to Fe and Mn-(oxy)hydroxides through the whole loose sediments profile, but for As strongly adsorbed form and for Cu form bound to organic matter also play the important role.

The pyrophosphate express method of Kononova-Belchikova was used for identifying the features of Au, As, Cu, Ni distribution with fulvic(FA) and humic(HA) acids in loose sediments. The results of this experiment showed, that sorption of Au is predominantly with HA, with the highest concentration of this element in B_1 soil horizon. Ni and Cu have the character of the distribution in the soil profile similar to Au, but these two elements form complexes predominantly with FA. The distribution pattern of As complexes with organic matter in the soil profile is different from the tested elements: As complexes bound to HA are dominated in A_2 soil horizon; other horizons are characterized with the accumulation of this element preferably in the form bound to FA.

This study was supported by the Russian Foundation for Basic Research (grant 16-05-00866) and St-Petersburg State University (ptoject 3.38.286.2015).