

July 05-07, 2018
Berlin, GermanyVasilina V Eskina et al., Arch Chem Res 2018, Volume 2
DOI: 10.21767/2572-4657-C3-008

DETERMINATION AND EXCRETE OF PRECIOUS AND ECOTOXICAL ELEMENTS IN METAL WASTES, APPROACH AND IMPLEMENTATION FOR THE AREAL CONTROL

Vasilina V Eskina, Dalnova A Olga, Vasilisa B Baranovskaya and Yury A Karpov

National University of Science and Technology MISiS, Russia

Control of the waste's chemical composition for the content of precious metals and toxic elements is an important part of any research accompanying reprocessing and disposal, as well as eco-analytical monitoring of natural objects are affected by waste. This research is related to the development and combined use of atomic spectral methods for analysis of metal-containing waste: atomic absorption and atomic emission, both in instrumental form and with sorption concentrating by a group of sulfur, nitrogen containing new type sorbents. The study is aimed at determining platinum metals (Pd, Pt, Rh) and toxic elements (As, Bi, Cd, Pb, Sb, Se and Te) in wastes. It is shown that platinum metals can be determined directly by the HR CS GFAAS method due to the high resolution of the spectrometer, despite the macro contents of the matrix elements. Macrocontains of matrix elements make it difficult to determine ecotoxic elements's microcontains by direct instrumental analysis. The most effective approach to solving this problem is the use of advanced synthesized by the authors S,N-containing heterochain sorbents possessing unique properties for group separation and concentration of toxic elements. Kinetic features of the toxic elements's sorption and properties of the synthesized sorbent depending on solution's acidity are explored. The sorbent is tested for separation and group concentration of ecotoxic elements in presence of macrocomponents of secondary raw materials for their subsequent determination in the range $n \cdot 10^{-6} - n \cdot 10^{-4}$ %wt by HR CS GFAAS and OES-ICP. The authors gratefully acknowledge the financial support of Russian Science Foundation (16-13-10417).

Biography

Vasilina Eskina works as research scientist of physicochemical analysis methods laboratory of quality and analytics department of State Scientific-Research and Design Institute of Rare-Metal Industry "Giredmet" JSC and is a postgraduate of NUST "MISiS" in the field of analytical chemistry (the last year of study). Eskina's scientific activity is focused on investigation of analytical capabilities of atomic-spectral analysis methods, use of synthesized sorbents for high-purity substances and secondary raw materials, development of highly efficient analytical techniques with high metrological characteristics. Author of more than 10 articles and 3 patents of the Russian Federation in the field of analytical chemistry and sorption.

vasilina92@mail.ru