

## **Rare minerals and trace elements in sulfide turbidites from Yubileynoye VMS deposit, South Urals, Russia**

A.S. TSELUYKO<sup>1,2\*</sup>, V.V. MASLENNIKOV<sup>1,2</sup>,  
N.R. AYUPOVA<sup>1,2</sup>, S.P. MASLENNIKOVA<sup>1</sup>, R.R.  
LARGE<sup>3</sup>, L.V. DANYUSHEVSKY<sup>3</sup>

<sup>1</sup> Institute of Mineralogy UB RAS, Miass, Russia  
(\*corresponding author: faenarus@gmail.com)

<sup>2</sup> South Urals State University, Miass, Russia

<sup>3</sup> CODES, Tasmania University, Hobart, Australia

The Yubileynoye VMS deposit is located on the boninite-basaltic basement of the Devonian West Magnitogorsk arc in the Urals. The ore body is interpreted as a degraded sulfide mound surrounded by an apron of sulfide breccias and sulfide turbidites. The breccias comprise well preserved fragments of chalcopyrite-pyrite-sphalerite chimneys, pyrite diffusers, biomorphic and colloform pyrite crusts and crystalline pyrite. In the sulfide turbidites, these fragments have undergone advanced alteration. Sulfide fragments were completely dissolved or sulfides were redistributed and recrystallized. Colloform pyrite fragments were replaced by authigenic chalcopyrite-2. Abundant authigenic tellurides, native gold or fahlores occur in the front of replacement. Chalcopyrite-2 inherited high contents of Mn, Tl, Te, Bi, Au, Ag, Pb from the colloform pyrite it replaced and contained less Se and Sn in comparison to hydrothermal chalcopyrite-1. In some sulfide turbidites, chalcopyrite-2 was recrystallized to metamorphic chalcopyrite-3 identified by twinned crystals. These crystals display very low contents of all trace elements and are not accompanied by rare minerals. It is suggested that authigenic processes in sulfide turbidites can produce abundant tellurides and other authigenic chalcogenides in addition to primary hydrothermal analogs revealed in the well preserved chimneys. This work was supported by RSF (project no. 14-17-00691).