

**MINERALOGIJA, HEMIJA I DISTRIBUCIJA
ODABRANIH MIKROELEMENTATA U UGLJU I GLINCIMA
IBARSKOG BASENA (JUŽNA SRBIJA)**

**MINERALOGY, CHEMISTRY, AND DISTRIBUTION
OF SELECTED TRACE-ELEMENTS IN COAL AND SHALE FROM
THE IBAR BASIN (SOUTH SERBIA)**

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Uzorci uglja iz rudnika Jarando, Tadenje i Progorelica i glinaca iz ležišta borata Piskanja (Ibarski basen) proučavani su primenom nekoliko analitičkih metoda (mikroskopija u propuštenoj svetlosti, rendgenska difrakcija praha (XRPD), skenirajućom elektronskom mikroskopom (SEM-EDS), infracrvena spektroskopija Furijeove transformacije (FTIR) i ICP-MS spektrometrija) radi određivanja njihovog mineralnog i hemijskog sastava. Ibarski basen se nalazi oko 200 km južno od Beograda i u njemu se eksploatiše kameni ugalj i istražuje borna mineralizaciju. Mineraloški i geo-hemijski podaci ukazuju da su glavni minerali u uglju kvarc, pirit, sa promenljivim sadržajem gline (kaolinit, montmorilonit, ilit), kalcit i sulfati. Framboidalni pirit je glavni nosilac sumpora u uglju. Glina i karbonati su često vezani sa maceralima u mineralno-bituminoznom kompleksu, što ukazuje na redukcione uslove tokom taloženja OS. U visokotemperaturnom pepelu uglja, konstatovan je veoma visok sadržaj As, Co, Cu, Cr i Ni, posebno u ležištu Tadenje. Sadržaj Mo, Sb, Pb, V, Zn je nešto viši u odnosu na Klark vrednosti za pepeo kamenih ugljeva. Uzorci glinaca iz ležišta Piskanja izgrađeni su uglavnom od mešavine dolomita i liskuna/glina sa promenljivom sadržajem albita do andezina, K-feldspata i kvarca. Visok sadržaj dolomita konstatovan je u višim delovima basena. Liskun se uglavnom javlja kao biotit, retko muskovit, dok su ilit i hlorit najzastupljeniji minerali glina. Sepiolit i verovatno paligorskit, pronađeni su u jednom uzorku u dubljim delovima basena. Sulfidi Pb, Zn i Cu, gips, celestin, barit, rutil i apatit su takođe konstatovani u dubljim delovima basena.

Ključne reči: Ibarski basen; kameni ugalj; mineralogija; mikroelementi

Coal samples from the Jarando, Tadenje and Progorelica mines and shale samples from the Piskanja boron deposit (the Ibar basin) were studied using several methods such as transmitted light microscopy, X-ray powder diffraction (XRPD), scanning electron microscopy with energy dispersive Xray spectroscopy (SEM-EDS), fourier transform infra-red spectroscopy (FTIR) and ICP-MS spectrometry for evaluating their composition and chemical properties. The Ibar basin is situated about 200 km south of Belgrade and contain high volatile bituminous coal and boron mineralisation. The mineralogical and geochemical data of coals indicated that the main minerals in coals are quartz, pyrite, with variable amount of clay (kaolinite, montmorillonite, illite), calcite and sul-

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phates. Framboidal pyrite sulfur is the main form of sulfur in the coals. Clay and carbonate are often associated with macerals in mineral-bituminous ground mass, implying highly reducing depositional environment. Very high content of As, Co, Cu, Cr and Ni was detected in high temperature coal ash, especially in Tadenje deposit. Content of Mo, Sb, Pb, V, Zn is slightly higher than Clarke value for bituminous coal. The shale samples from the Piskanja deposit revealed that study area mostly consists of mixture of dolomite and mica/clay minerals with variable amount of albite to andesine, K-feldspars, and quartz. High dolomite content was observed in the upper parts of the basin. Mica is mostly biotite and rarely muscovite, while illite and chlorite are the most abundant clay minerals. Sepiolite and probably palygorskite, were found in one sample. Pb, Zn and Cu sulphides, gypsum, celestine, barite, rutile and apatite were detected in the deeper parts of the basin.

Key words: *Ibar basin, chemistry, mineralogy, trace elements*