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COMPOSITION AND QUALITY PECULIARITIES OF COAL FROM THE NORTHERN CONTINUATION OF THE LVOV- VOLYN BASIN

Summary. The paper presents new data on petrographic content and quality of the Visean coal from the northern continuation of the Lvov- Volyn Basin. It was revealed that the coal under examination is characterised by different properties, than coal from the other parts of the basin, what is connected with specific conditions of its formation. It was underlined that coal quality analysis is necessary for solution of problems connected with coal utilisation and protection of the environment.

CHARAKTERYSTYKA SKŁADU PETROGRAFICZNEGO I JAKOŚCI WĘGLA Z PÓŁNOCNEJ CZĘŚCI ZAGŁĘBIA LWOWSKO-WOŁYŃSKIEGO

Streszczenie. Publikacja przedstawia nowe dane o składzie petrograficznym i jakości węgla z utworów wizenu północnej części Zagłębia Lwowsko-Wołyńskiego. Stwierdzono, że odznacza się on wyraźnie odmiennymi cechami w stosunku do węgla występującego w pozostałej części Zagłębia, co wynika ze specyficznych warunków, w jakich powstawał. Podkreślono konieczność analizowania danych, charakteryzujących jakość węgla, w celu rozwiązywania problemów związanych z praktycznym jego wykorzystaniem i ochroną środowiska.

This publication is the sequel of earlier published papers about coal-bearingness of the: Lvov-Volyn basin northern part [4]. Therefore it necessary to note that at last years within Carboniferous late vial continuity alongside the state border with Poland from Vladimir-Volynsky in the south and to Byelorussian border in the north more than 7 coal intercalations of late Visean and Early Serpuchov are discovered. But only one Visean coal seam V_o^3 with practical value. It is situated at the bottom of coal-bearing deposits 1-60 m of thickness placing with erosional unconformity at Cambrian and Silurian sediments. The close dependence between coal-bearingness and peculiarities of under Carboniferous paleorelief is established. It manifests by coal seams V_o^3 parting into 2 (V_o^{3H} and V_o^{3B}) everyone 1,2-2,1 m in thickness, the complication its architecture in duration to ancient valley shaped depression and the preference coal parts with economic thickness to paleovalleys sides. Usually this coal seam have no economic thickness within paleoelevations and it is replaced by coal argillites and even edges away. Such dependence for overliening Visean and Serpuchow coal seams in lack.

Seams are mainly introduced by semidull clarain-durain and dull durain. The main organic components of these coals are from vitrinite group (at an average 48,6%) with the domination of collinite (33,1%). Telinite is with the smallest amount (14,8%). Amount of inertinite group is 26,2% with relatively abundant of heptafusinite (8,4%). Content of liptinite group is near 20,2%. Sporinite dominated. Microspores are with the highest content and macrospores and sporangium fragments are with the smallest amount. These elements are very deformed and disorderly oriented.

High content of mineral substances (19,9-60%) is characteristic of these coals.

Fine-dispersional clay prevail. Coals are with average and high sulphur content. Percentage of total sulphur varies from 0,5 to 8,4%. Coal washability from mineral substances and sulphur is very hard. Amount of volatile matter consist 41,8-56,7%. Coals belong to the first stage of metamorphism by quantity of vitrinite reflection. Coals combustion heat is 32,432.7 mJ/kg. Coals are lithoid type G.

By micropetrographic composition and in accordance with the coeval classification [1] coals intercaltions V03H, V0313 of the Lvov-Volyn basin north part are attrite mixitehumolite and lipoid-fusinite-hoelite. They contain the smallest amount vitrinite components and the highest content of inertinite elements, mineral substences, sulphur and the dominance of collinite over telinite from other coals of the Lvov-Volyn basin (table).

Table 1

Microcomponents' composition of Carbonifrous coals of Lvov-Volyn basin

Coal extent and age		Microcomponents, %		
		Vitrinite	Inertinite	Liptinite
North continuation of Lvov-Volyn basin . V_O^{3H}, V_O^{3B}		49,6	26,2	20,2
Main areas of basin	Late Serpuchov- Early Bashkir	70	23	7
	Late Visean-Late Serpuchov	76	19	5

Results of paleogeographic reconstructions [4] and studying of coal composition and quality show complicate specific formation of coal intercalations V_o^{3H}, V_o^{3B}. Accumulation of origin plant matter of these seams took place in very flowing, periodically draining swamps of inconstant environments. Autochthonous peat from arised with suballochthonous one. Such type of coal accumulation is characteristic for coal-bearing formations situated at erosional surface underlying sediments (Podmoskow, Dneprov and other basins) [2,3]. Origin accumulation of the west part of the Lvov-Volyn basin was in periodically straining and poorly flowing swamps of coastal plains.

Chemical-technological properties and peculiarities of petrographic composition are interpreted to be a function of coal formation. High ashes and sulphur, hard washability, high amount of volatile matter necessary discount under practical using coals and environmental protection.

References

1. Ginsburg A.I. – Usłowija obrazowanija uglej kłassa lipoidolitow. // Pietrograficzeskije tipy uglej SSSR. Niedra, 1975.
2. Korżeniewskaja A.S., Szulga W.F., Winogradow B.G. i in. - Litołogiczeskaja charaktieristika wiziejskoj uglenosnoj tołszczi // Geołogija miestorożdienij ugla i goriuczich slancew SSSR. T.2.M. Gosgeołtiechizdat,1962.
3. Radziwiłł A.J., Guridow S.A., Samarin M.A. i in. - Dnieprowskij burougolnyj basejn. Kijew. Naukowa Dumka,1987.
4. Szulga W., Lelik B., Iwanina A. - O nowym typie akumulacji węgla w Zagłębiu Lwowsko-Wołyńskim // XXI sympozjum "Geologia formacji węglonośnych Polski". Materiały. Kraków 1998.

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