Cr-SPINELS FROM MESOZOIC VOLCANIC ROCKS FROM PODMANÍN (WESTERN CARPATHIANS, SLOVAKIA)

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Cr-spinels belong to the most important petrogenetic indicators of ultramafic and mafic rocks. Cr-spinel composition was used to classify the source material (POBER & FAUPL, 1988, etc.). Cr-spinel detritus in Mesozoic complexes of the Western Carpathians has been identified in different rock types (carbonates, sandstones and others) in central Western Carpathians, in the Klippen belts, Manín unit, Tatricum, Fatricum and Hronicum. Mesozoic volcanics have been considered one of the possible sources of Cr-spinels and due to that we have focused on this rock type.

Cr-spinels from Podmanín were extracted from about 15 kg of the concentrate from hyaloclastites–hydroclastic volcanic breccias. Cr-spinel has been preserved as the only primary mineral (from among olivine, pyroxene, amphibole and Cr-spinels). Volcanics are part of the Manín unit and were incorporated into Lower Cretaceous complex of strata. Chemical composition of fresh volcanics corresponds to primitive alkali volcanites (HOVORKA & SPIŠIAK, 1988). Chemical composition of Cr- spinels was studied with JEOL SUPEPROBE 733 (GSDŠ Bratislava). The chemical composition of Cr-spinels is presented in Table 1. On the basis of chemical composition we have determined two types. The first has low Cr and Fe contents and high Al and Mg contents compared to the other type. The contents of Mn, N, Ti and Zn are low in both these types. Two different types can be recognized also from histograms of Cr and Al distribution. On the basis of Cr-spinels classification (KLEIN & HULBURT, 1985) both these types are close to spinel solid solution.

We have compared the composition of studied Cr-spinels with those from Mesozoic picrites from Poniky and from Mesozoic sediments of a wider area. With its chemical composition the first spinel type corresponds to the spinels from picrites from the area of Banská Bystrica (SPIŠIAK & HOVORKA, 2000). These rocks are ranked to the formation of Lower Cretaceous alkaline basalts-basanites.

These are no equivalent for the 2nd spinel type among spinels from Mesozoic sequences of the close vicinity. Owing to the available data it can be compared to the 1st spinel type from serpentinite sandstones of the Šambron zone (SPIŠIAK *et al.*, 2001). According to geochemical criteria these spinels are likely to come from ultrabasites of Alpine type. They show lherzolite affinity (derived from the Penninic Ocean?). In the present state of knowledge we are not able to say unambiguously whether the second spinel type was brought from another source to volcanoclastics, or it was pulled off the host rocks during the ascent of volcanites.

On the basis of different discriminant diagrams, (e.g. JAN & WINDLEY, 1990) the Cr-spinels being studied and compared are lying in the field of residual peridotites of ophiolite complexes.

Table 1

	Type I				Type II			
	1	2	3	4	5	6	7	8
FeO	11.13	11.66	11.83	11.63	17.87	17.81	18.36	19
Al_2O_3	55.28	55.44	56.51	55.89	36.36	34.35	36.32	32.92
Cr_2O_3	12.43	11.31	11.22	11.09	27.81	29.14	27.63	30.56
MgO	20.46	21.13	20.71	20.75	17.77	17.06	17.61	17.27
TiO_2	0	0	0	0	0.99	1.1	0.89	1
MnO	0.03	0.07	0.02	0	0.08	0.1	0.1	0.09
NiO	0	0.02	0	0	0	0	0	0
ZnO	0	0	0.01	0	0	0	0	0
Total	99.33	99.63	100.3	99.36	100.88	99.56	100.91	100.84
formula based on 4 oxygens								
Fe^{2+}	0.2	0.18	0.2	0.19	0.28	0.29	0.28	0.29
Fe^{3+}	0.04	0.07	0.05	0.06	0.14	0.13	0.15	0.16
Al	1.7	1.69	1.71	1.71	1.2	1.16	1.2	1.1
Cr	0.25	0.23	0.22	0.22	0.62	0.66	0.61	0.68
Mg	0.8	0.81	0.79	0.8	0.74	0.72	0.73	0.73
Ti	0	0	0	0	0.02	0.02	0.01	0.02