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Metasomatic column with the apobasite listvenites end-member from the Slovinky-Gelnica ore field (Gemeric Superunit, Western Carpathians) and comparison to their type localities from Ural

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A metasomatic column (or metasomatic zone pattern) is the complete sequence of metasomatic zones characterising an individual metasomatic facies (Zharikov et al. 2007). The genesis of this column is the result of a series of processes, in the case of basic rock protolith leading to the formation of apobasite listvenites (in the sense of Sazonov 1975). It includes three partial processes: 1) carbonatization, 2) silicification and 3) formation of mica (e.g. Plissart et al. 2009) involving the infiltration of a CO_2-rich fluids and shows similarity to processes of listvenitisation (e.g. Clayton 1993). Field research in Slovinky-Gelnica ore field has revealed the presence of such a metasomatic column (cf. Ivan 1987). It comprises metabasites as the protolith, carbonatised metabasites, listvenite-type metasomatites and listvenites s.s. The metabasites have features of subvolcanic rock types (Ivan 2009), what makes them comparable with similar rocks from Ural. The petrographic study of selected samples has showed that amphibole, chlorite and albite became progressively unstable in this sequence of alterations, replaced by carbonate, silica and lastly by the muscovite minerals, sericite or fuchsite (Ivan 1987). Carbonates change their quantity as well as mineralogical composition with the development of the column in two trends of changes: towards Mg-Fe carbonates or Mg-Ca carbonates. Regarding the samples from Ural, Fe-dolomites and ankerites predominate, the metasomatic columns derived from gabbros and dolerites are essentially the same. The geochemical study of rock samples from the study area (22 whole rock analyses) as well as the comparison with similarly metasomatised rock series from Ural (56 analyses) allowed as to give more detailed characterization of the metasomatic column. The most obvious change is a clear increase of K with decreasing Na as a sign of the albite break-up and K-rich minerals (such as muscovite) formation. The increase of LOI and CO_2 indicate the process of carbonatisation. Listvenitisation is often associated with the hydrothermal ore veins formation and the rare metal mineralization with concentration of elements such as Au, Co, Sb, Cu, Ni (e.g. Dinel et al. 2008, Buckman & Ashley 2010). This could be significant as regards the genesis of stratiform ore deposits within the Slovinky-Gelnica ore field.

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