

DISCUSSION

New Data on the Stratigraphic Position, Mineralogy and Chemistry of Nanos Bauxite Deposits and Adjacent Carbonate Rocks, Slovenia

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I have read with great interest the paper by DOZET et al. (1993). However, I have some remarks concerning the sections on the MINERALOGY and GEOCHEMISTRY, presented in the paper. The remarks are as follows:

1. In Table 2 entitled "Chemical composition of the bauxites", DOZET et al. (1993) give among others, data (in wt %) for:

- sample 1091 - CaO 54.90, Ign. loss 43.54, Al₂O₃ 0.47, SiO₂ 0.01, ;
- sample PO-26 - CaO 54.03, Ign. loss 42.56, Fe₂O₃ 0.05, Na₂O 0.05, K₂O 0.05,

Most of these data are also stated in the text of the section GEOCHEMISTRY, as exemplified by comments on the bauxite composition, for example (p.237): "The analyses show that the alumina content of the Jurassic bauxites of the Nanos area is medium to high, Fe₂O₃ and SiO₂ high, and loss on ignition relatively low (11.71-43.54%). The Al₂O₃ content in the Nanos bauxites varies from 0.47% to 59.46%. The Fe₂O₃ content is relatively low (0.05% to 24.40%) ...".

However, according to the data given in Table 2, it is obvious that samples 1091 and PO-26 are not bauxites but limestones. For that reason the discussion on the chemical composition of bauxites in the section on GEOCHEMISTRY cannot be accepted.

2. Table 1 entitled "Mineral composition of the bauxite" (DOZET et al., 1993) demonstrates that samples 1092/3B, PO-25-2, and PO-24-4J contain a lot of kaolinite and goethite. However, the samples do not contain minerals characteristic for bauxites and therefore they are not bauxites (or clayey bauxites). Based on the mineral compositions which are presented in Table 1 these samples are probably terra rossa.

3. For the same locality the term "Volčja jama" was used in Fig. 1 and Table 2, and "Volčja Draga" in Table 1.

4. There are essential differences between the chemical composition of samples as determined by chemical analysis (Table 2) and the chemical composition of the same samples which results from the mineral composition

presented in Table 1. For instance, according to data presented in Table 1, sample 1092/5A contains muscovite/illite (1%), kaolinite (12%), boehmite (65%), lepidocrocite (11%), goethite (3%), haematite (3%) and anatase (5%). If an ideal chemical composition of the minerals is assumed, then the following chemical composition (wt %) of sample 1092/5A corresponds to the given mineral composition:

Al₂O₃ 60.56, Fe₂O₃ 15.58, SiO₂ 6.21, TiO₂ 5.00, K₂O 0.12, Ign. loss 12.54.

However, by means of the chemical analysis (Table 2), the following chemical composition of the sample is determined (wt %):

Al₂O₃ 27.91, Fe₂O₃ 38.45, SiO₂ 19.65, CaO 0.42, MgO 0.15, SO₃ 1.66, Ign. loss 11.77.

It is obvious that the mineral composition of the sample (Table 1) and its chemical composition (Table 2) are not compatible.

5. For most samples which, according to Table 1, contain relatively large amounts of anatase (for example, sample 1092/4A contains 7 % anatase), there are no data on the TiO₂ content in Table 2, but the sum of fractions of all components is practically 100%. The authors did not mention the method(s) used in determination of the chemical composition. If the contents of Si, Al, Ti, Fe, Ca and Mg were determined by classical silicate analysis, then the given content of Al₂O₃ represents the sum of contents of Al₂O₃ and TiO₂ in samples, for which the content of TiO₂ is not given in Table 2.

6. For most samples the sum of mineral fractions in Table 1 is between 99 and 101%. However, Table 1 does not include data on the amorphous component. According to our experience, bauxites, terra rossa, and clays generally contain amorphous components (mainly of SiO₂, Al₂O₃ and Fe₂O₃ chemical composition), the presence of which can be detected by X-ray powder diffraction.

DOZET et al., (1993) quote: "The quantitative mineralogical composition of the bauxite samples was determined by X-ray diffraction". However, it is well known, that the accurate quantitative mineral composition of bauxites, terra rossa, clays etc. cannot be reliably determined only by X-ray diffraction analysis. This is one of the reasons that the data presented in Tables 1

and 2 are in disagreement. Approximate fractions of minerals in the considered samples can be determined using several analytical methods, in the first place X-ray semiquantitative diffraction phase analysis, and chemical and thermal (DTA, TG, DTG) analyses, providing the analyses are correctly applied.

REFERENCE

DOZET, S., MIŠIČ, M. & ŽUŽA, T. (1993): New Data on the Stratigraphic Position, Mineralogy and Chemistry of Nanos Bauxite Deposits and Adjacent Carbonate Rocks, Slovenia.- *Geol. Croat.*, 46/2, 233-241.

REPLY

Editorial comment: the manuscript of this discussion was presented to the authors, but they have no reply at present.