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GOLD CONTENT IN BARITE AS A POSSIBLE GEOCHEMICAL INDICATOR FOR GOLD-BEARING MINERALIZATIONS

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INTRODUCTION

Barite is one of the most widespread minerals in the Earth's crust. It occurs in barite and complex (barite-iron sulphides, barite-base metallic and fluorite-barite-base metallic) endogenic and exogenic mineralisations of different size or is present as an accompanying mineral in the ores of almost all other genetic and compositional types of mineralisations including the gold-bearing deposits. The later fact represents the guideline for a more systematic research on the gold content and distribution in barite with the aim to look for some additional indications for the gold prospects of newly found barite-containing ore mineralisations as well as of already but still not studied in that aspect mineralisations.

MATERIALS AND METHOD OF STUDY

The gold content in monomineral samples of barites has been determined by neutron-activation analysis with detection limit of the method of 0.0001 ppm (or 0.1 ppb) and precision of +/- 25% (analyst R. Jankova). The results are shown in table 1.

The investigation included barites from ores with and without gold mineralisation in Bulgaria (exept for Madneuli deposit in Georgia). The first type of ores was presented by the Alpine epithermal high sulphidation (copper-pyritic ores of Chelopech, Baryta and Madneuli deposits) and low sulphidation (gold-polymetallic ores of Madzharovo deposit) gold mineralisations and the Hercynian mesothermal quartz-gold-sulphide (quartz-gold ores of Govezhda deposit) and barite-gold-polymetallic (barite-gold-polymetallic ores of Kashana deposit) vein mineralisations. The second studied type of ores covered the mineralisations of the Alpine (Martinovo and Mihalkovo deposits) and Hercynian (Tran and Seslavtsi deposits) barite, fluorite and barite-fluorite vein mineralisations as well as

Table 1. Gold contents of barite from ore deposits with gold (Group A) and without gold (Group B)

Type of mineralisation	Ore deposit	N	Range	Content of gold (ppb Mean
GROUP A				
1. Copper-piritic-	Chelopech	3	38.6 - 39.6	39.0 gold
	Baryta	9	12.7 - 293.6	110.4
	Madneuli	1	25.1	
2. Gold-polymetallic	Madzharovo	3	135.0 - 139.7	137.7
3. Quartz-gold	Govezhda	1	28.6	
4.Barite-gold polymetallic	Kashana	3	14.2-17.6	15.9
GROUP B				
1. Baritic	Martinovo	1	9.1	
	Zlata	1	6.2	
	Seslavtsi	1	2.0	
	Iskar defile	9	1.0-3.0	1.8
2.Fluorite and fluorite-baritic	Mihalkovo	1	8.0	
	Tran	2	3.0-9.0	6.0
3.Fluorite - barite-polymetallic	Yugovo	5	1.0-52	2.5
	Ustrem	5	1.0-5.0	3.0
	Chiprovtsi	1	3.2	
4. Polymetallic vein and metasomatic	Madan	1	1.1	
4. Polymetallic, stratiform	Sedmochislenitsi	3	1.0-9.2	6.0
	Kremikovtsi	7	1.0-6.0	3.1

N - the number of studied samples; Madneuli - deposit in Georgia

the fluorite-barite-polymetallic vein (Jugovo and Ustrem deposits) and metasomatic (Chiprovtsi deposit) mineralisations and stratiform polymetallic ores of Sedmochislenitsi and Kremikovtsi deposits.

CONCLUSIONS

The gold content in barite differs from one to the other, being generally low and comparatively evenly distributed in each of the deposits.

The mineralisations studied can be divided in two large groups:

- Group A- gold-bearing deposits with a gold content in barite from o.n to o.on ppm, and
- Group B- deposits without gold; the gold content in barite from this group of deposits is one to two orders lower (o.oon ppm and lesser) compared to this in barite from deposits of group A.

The two groups of mineral deposits can be, therefore, easily distinguished by the gold content of the occurring in them barite, and this regularity can be applied as a typo-chemical feature (geochemical indicator) in defining the practical importance of every barite-bearing mineralisation in gold-bearing aspect.

The scarce published data on gold content in barites (Boyle, 1979; Davletov, 1974; Zakirov, 1986) do not contradict to this conclusions. Therefore, we believe that the results obtained are not fortuitous, and that they represent a definite interest in the study of such an important problem as the prospecting for gold-bearing mineralisation.

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