5th JUBILEE BALKAN MINING CONGRESS

PROCEEDINGS

18th-21st September 2013 Ohrid, Macedonia

ELEM
MACEDONIAN POWER PLANTS

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BALKANMINE 2013

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QUARTZ RAW MATERIALS IN THE REPUBLIC OF MACEDONIA

Krsto BLAZEV[1]
Blagica DONEVA
Marjan DELIPETREV
Gorgi DIMOV

Faculty of natural and technical sciences, Stip, Republic of Macedonia

[1] *krsto.blazev@ugd.edu.mk*

ABSTRACT

This paper presents registered reserves of primary and secondary quartz raw materials, or quartz and quartzite on the territory of the Republic of Macedonia. Analyses of the reserves showed balance and out of balance reserves of quartz raw materials.

Mineral raw materials are not only geological term, but they are technical and economical category with known economic dimensions and specificity manifested in the fact that they are specific recourse. The nature created them in the ore deposits, with limited quantities and naturally non-renewable and could not be reproduced.

Their specificity is expressed in the way of their finding, the risk and the procedure of their exploitation, as well as the preparation for further industrial processing and application, i.e. their final valorization.

Keywords

Quartz, Quartzite, Reserves

1. INTRODUCTION

The geological - economic assessment of silica raw materials in Macedonia, actually, is that explored reserves of silica raw materials are defined by the quality, quantity and location of where they are located. Based on this data are obtained basic economic parameters expressed through natural indicators as starting points for economic importance of these resources and their final evaluation. In such a procedure should be taken into account predicted and partially explored sites and perspective areas to find them. In this particular context specificity is determined by the fact that determined reserves in the deposit will not be exploited and evaluated at once, but it depends on the capacity for exploitation, as well as their consumption or market need.

From the economic point of view, it should be said that Macedonia has relatively good base of silica raw materials in which are invested significant funds for their research. But very small number of them is in exploitation and processing of the materials into final product or material for the market. This requires new investments. Nowadays, finding of investment assets is especially difficult. It is needed, possible investments to be in such objects where for shorter time will be reproduced and the effects of investment justified.

Because natural conditions in the deposit, exploitation and market factors are changeble, and the realization should be realized in different period, longer or shorter, depending on the quantities of the raw material, exploitation capacity, or the market need should imply the action of the time factor, or not to refer to the time when valuation was made.

Geological - economic evaluation of the mineral resources, besides natural, should display value indicators necessary for long-term planning of their development and determination of optimal economic potential. To make full economic - value assessment of silica raw materials, it is necessary to analyze at least one decennial period in which the economy operated in relatively normal conditions. Unfortunately, in the last decade we have witnessed an extremely unfavorable economic situation in our country where is seen a great reduction in the production of silica raw materials. For the movement of prices, current conditions can make a real implementation in terms of annual indicators and unrealistic data from the annual accounts of companies that are producers of silica raw materials.

For these reasons, full economic - value assessment of silica raw materials in Macedonia is very difficult to give, and any assessment of these materials was not made. It is an attempt, using the known data, to present the status of these resources which would be a basis for understanding their geological - economic importance.

Methodology procedures for evaluation of the mines and deposits of mineral raw materials are different around the world and basically, depends on social - economic systems. Generally, two methodologies are accepted:

- Methodology of H. D. Hoscold in the western industrial countries where economic evaluation is based on the annual profit which is discounted with accumulative and speculative interest rate. With aim to obtain lover value of the mine, it is applied high speculative rate which allowed significant lowering of taxes. With some modifications from more authors, this methodology is the most used in many developed industrial countries.
- Methodology of B. Milutinovik is complex methodology and reffers to the economic assessment of the deposits wather are in exploitation or not. In addition, it is started from the conditional profitability of the deposit, which is, or will be achieved by exploiting the same. The value of income increases with increased volume of production. The total revenue decreases the value of the gross wages of workers, and depreciation of fixed assets and reproduction of the site. In this methodology, in addition to the normal, is inserted and corrective interest rate tied to the natural factors of the deposit and changing conditions of the exploitation.

In this case, from the previously stated reasons, there is no real value indicators, so the geological - economic assessment would only consisting of natural, i.e. quantitative and qualitative indicators of mine works in terms of annual capacity for exploration and production. Basically, it started in the assessments of reserves of silica raw materials in terms of exploration of the deposits, i.e. deposits with determined and suspected reserves. The group of deposits of quartz could be found two special economic categories as primary and secondary deposits as significantly differ in their economic value or cost of exploitation.

The results from this assessment will be useful factor in selection of indicators and selection of the most perspective deposits of silica raw materials when defining long term and perspective economic variants which will be define in social and economic develeopment plans.

2. BASIC NATURAL INDICATORS OF THE DEPOSIT OF SILICA RAW MATERIALS

A qualitative review of the reserves of silica raw materials is a synthesis of the results of the overall knowledge, field observations and detailed research and would be a basis for their economic potential, or economic significance.

Quartz reserves

Quartz deposits in Macedonia, related to the exploitation conditions and their quality, are different. Basically, primary deposits are characterized with especially high quality in relation with secondary deposits, but primary quartz deposits are limited in reserves and very difficult for exploitation (drilling, blasting, selection etc.). Their economic justify exploitation would be only in case of higher valorization of the mineral raw material.

From the other side, secondary deposits of quartz are with more reserves, better conditions for exploitation, possibility for full use of the deposit and its by - prodicts, and as a result are more efficient. In relation with the quality, they are with lower quality, excluding some localities where the quartz is with extremely high quality.

Considering that primary goal is to show the economic importance of these resources, and starting from the above, is made separation to their economic value under conditions of exploitation and their quality as primary and secondary deposits, and the extent of excavation with specified and assumed reserves.

Primary deposits of quartz with total determined reserves by 199 022,00 tons are find in the three specific locality - Umlena, Beluce and Preseka, and primary deposits with assumed reserves of quartz have more and the total reserves are defined as 624 500.00 tons.

From the above said can be concluded that primary quartz deposits are very little or insufficiently explored. It is based on the expensive exploration and exploitation and their uneconomical related to the secondary deposits. Due to their high quality, interesting sites were explored.

In the group of primary deposits should be highlighted occurences and deposit of pieso - optical quartz Budinarci - Berovo. Due to their high quality (dimensions and clearness of quartz ctystals), and the knowledge about their use, in the future should be paid attention to their detail exploration. Recent knowledge of its occurence on these terrains and field observations of the wider vicinity of Budinarci - Mitrasinci, give possibility to expect econimicaly interesting concentrations.

Secondary quartz deposits, different from the primery, are more investigated due to their compatibility and economic justification for detailed investigations. As with previous investigations have identified large amounts of balance reserves of 12,187,115.00 tons, assumed reserves are not taken into account.

Quartzite reserves

Quartzite deposits are widespread on the territory of the Republic of Macedonia. As primary deposits are found in Paleozoic complexes. They have relatively high level of exploration, some deposits where reserves are prognose. Total determined balance reserves of quartzites are 24.808.550,00 tons, and total assumed reserves are 16.308.000,00 tons. Regarding the conditions of exploitation, there are almost no significant differences, if neglected infrastructure so that there are no reasons for their classification as the deposits of quartz.

Assessment of quality of quartzites as a useful raw material depends on their application or the physical - mechanical properties, and in particular the chemical composition and the presence of harmful components which condition the quality. There is an important difference in the quality of the raw material from one deposit to another, so for some is characteristic very high quality, and some extremely poor quality. The content of SiO_2, at various deposits, is in the range of 92-99%.

3. CONCLUSION

Reserves of silica raw materials in Macedonia are balanced based on the total current knowledge and research and are not tied to a particular period, because the current exploitation in terms of total reserves is almost neglect. For those deposits which are in exploitation, simultaneously with the exploitative works is conduct further research and supplement of exploited quantities, a given that research were conducted on much larger areas and in large volumes, it is possible today with very high reliability and accuracy accept reserves of silica raw materials in Macedonia.

Undoubtedly, despite the extent of the investigation of silica resources is relatively low, displayed reserves of these raw materials are quite large. Given the opportunities and prospects for research on the territory of Macedonia, the fields in which it is possible to expect deposits of quartz and quartzite, further explorations will surely give positive results both in quantities sufficiently investigated categorization of reserves, and the quality making sure that base on these mineral resources will increase significantly.

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