3. Дмитриенко Г.А., Шарапатова Е.А., Максименко Т.М. Мотивация и оценка персонала. Учебное пособие – МАУП, 2012. – 248 с.
4. Müller, K. Methoden und Qualität in Gründungslehre, Gründungscoaching und Gründungsberatung - Interventionen und Innovationen/ C. Diensberg – Köln: BIEM, 2011. – 364 S.

AN INDEX OF CRYSTALLINITY IDENTIFICATION OF QUARZITES BY X-RAY DIFFRACTION

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Due to such characteristics as abundance, high-purity and cheapness, quartz rocks, such as quartzites and quartz sand, are becoming more and more perspective sources in different industrial areas. An excellent example is Antonovsk quartzite deposit clusters in Western Siberia, Russia [1,2]. The quartzite origin pertains to sedimentary-metamorphic deposits and is the product of lithification under conditions of the early metagenesis of quartz-hydromica-sericite facies [3]. As a result of the metamorphism of biogenic siliceous thickness, amorphous silica is crystallized forming crystalline □-quartz phase.

It is assumed that the estimated degree of silica thickness and the identification of the purest quartzite varieties could be determined by the Ki crystallinity index in X-ray diffraction patterns which was first proposed by Murata & Norman [4].

Quartzite samplings from different ore bodies of open-pit "Sopka-248" are transformed into finely-crushed samples and further compressed into a "tablet". Measurements were carried out on the diffractometer X»Pert PRO. X-ray diffraction patterns indicated increments of 0.02 in the range of 5-70 degrees; 2θ at rotation 30 rpm and exposure of 0.1 sec. The peak intensity of $2\theta = 67{,}74^{O}$ at multiplet peak within $67^{O}\ldots69^{O}$ (Fig.) was used to calculate the "crystallinity index".

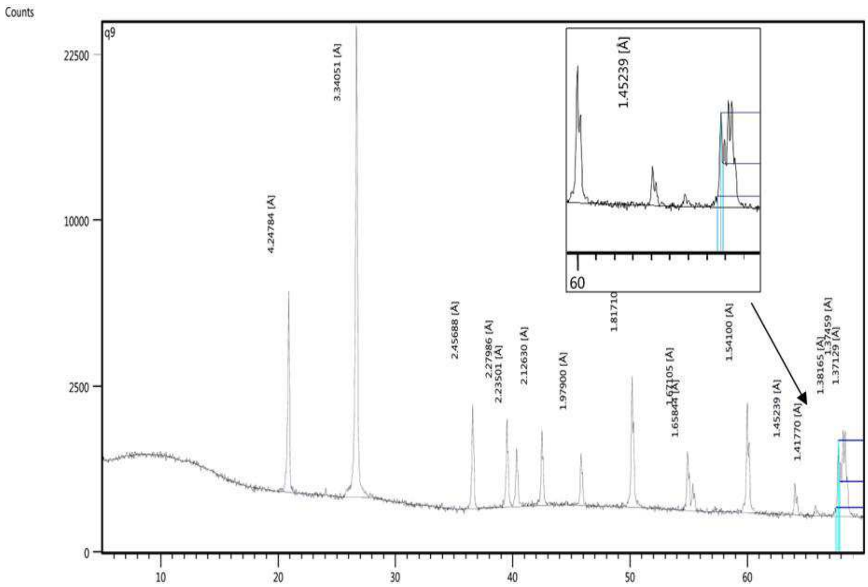

Fig. Multiplet peak within 67*O…69O* on the X-ray diffraction pattern to calculate crystallinity quartzite index according to Murata & Norman method

The peak intensity values of $2\theta = 67{,}74^{O}$ are used in the following formula 10 Kci = F a / b, proposed Murata & Norman. Calculated values for crystallinity index different quartzite types presented in Table.

Table

Estimated value of quartzite crystallinity index in deposit "Sopka-248"

Quartzite sample	Crystallinity index K_{ci}
White quartzite	1,9
Grey quartzite with iron oxide spots	3,5
Grayish quartzite with clay matter spots	4,0
Black quartzite	4,0
Grey quartzite with Mnspots	4,4
Jasperoid brownish- red quartzite with black veins	0

Microcrystalline quartzite deposit "Sopka-248", a relatively highly- pure deposit, is characterized by the calculated crystallinity index values within 1.90 ... 2.28. Quartzites change their chemical composition and color, while their crystallinity index increases up to 3.16 ….4.40 relative to depth increase and from the central zones to the periphery of the ore bodies. It is assumed that quartzite crystallinity degree increase is associated with superimposed metamorphic processes, resulting in the formation of crystalline -quartz phase. In local areas, especially in increased crushed zones, initial chemically pure quartzites under the impact of supergene processes degrade, while their crystallinity degree increase up to 5.6 in some areas.

These values reflect some relative crystallinity index values representing the degree of quartzite conversion. The crystallinity index estimates in accordance to Murata & Norman method [4] applying the multiplet peak of 2θ = $67{,}74^{O}$ verify the results obtained by IR spectroscopy [5].

It should be noted that the calculated values of quartzite crystallinity index according to proposed method are quite relative and can be used in the comparative analysis within one ore deposit. The bond between quartz micro-grain sizes and crystallinity index has not been established yet. This estimation could be a genetic feature and used further in metallurgical sampling in view of the fact that most samples indicated the lowest crystallinity index values.

References

1. Ananiev Y.S., Ananieva L.G., Dolgov I.V., Korobeinikov A.F., Korovkin M.V. Prospecting, estimation and enrichment of quartzite sources for high technology// TPU Izvestja, 2001. - V.304. - N. 1. - pp. 123 - 130.
2. Ananieva L.G., Korovkin M.V. Mineralogist-geochemical study of quartzite from Antonovsk deposit clusters // TPU Izvestja, 2003. - V.306. – N. 3. - pp. 50 - 55.
3. Korovkin, M.V., Ananieva L.G. Estimation of quartzite metamorphism degree in Antonovsk deposit clusters to the mineralogical data // Mineralogy, geochemistry and mineral resources of Asia. Tomsk: Tomsk CSTI - branch FGBU "CEA" Russian Ministry of Energy, 2012. - Issue 2. - pp. 139 - 144.
4. Murata K.J., Norman II M.B. An index of crystallinity for quartz // American Journal of Science. – 1976. – V. 276. – pp. 1120 – 1130.
5. Korovkin M.V., Ananieva. L.G., Antsiferova A.A. Assessment of quartzite crystallinity index by FT-IR. In: Broekmans MATM (editor): Proceedings of the 10th International Congress for Applied Mineralogy (ICAM), Trondheim, Norway. – 2011. - pp. 403 - 410.

ABILITY OF PEAT SORBENT TO REMOVE OIL SPILLS FROM THE WATER SURFACE

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The increase of global energy demand has stimulated the construction of new pipeline systems, and the Russian Federation is no exception to this. That's why the issues of pipeline reliable operation have become a matter of a great concern. It is a well-known fact that pipeline reliability is determined not only by the quality of the pipeline material, but also by a trouble-free operation and thorough oil-spill prevention. The environmental impacts of pipeline operation depend both on pipe installation methods and such an important factor as timely and effective responses to environmental emergencies, including leak detection and oil spill elimination.

Tomsk region has significant peat fields. Due to its incomparable properties, peat is frequently used in manufacturing an affective sorbent to clean up hydrocarbon spills spread over a water surface. Development of peat-based sorbents for the removal of oil and petroleum products from water surface could become effective technology in saving marine environment and ecosystem. Therefore, the research aimed at studying peat sorbent properties within different deposits is of great importance.

Thus, the purpose of our research is to deploy an effective pollution prevention strategy that leads to successful oil leak prevention and efficient oil spill cleaning up at sea, even at low temperatures.

In order to achieve this purpose, it is necessary to figure out the following objectives:

- to conduct oil spill risk analysis and provide corresponding oil spill responses;
- to propose the ways of collaboration between oil and peat industries;
- to carry out an experimental investigation of peat sorbent.

Many ecologists state that oil production inevitably lead to ecological disaster. To reduce the risk of possible oil spills, it is necessary to develop a set of actions on the prevention and elimination of oil spills.

However, it is rather difficult to estimate actual volume and extent of oil spill and its further consequences, because it is necessary to consider a number of such environmental conditions as tidal stream and direction of near-water wind, sea temperature, salinity and etc. which directly influence the velocity of oil spill propagation.

Spill response procedures in ice and open water are fundamentally different. Oil spill prevention and response capabilities in ice-covered waters pose additional problems to be solved. It's obvious that such conditions significantly complicate spill response, at the same time, it seems reasonable to admit that oil spill will occupy much smaller area in ice-infested water.

Anyway, under ice condition, it's necessary to use special equipment such as arctic skimmers and special materials, which efficiently absorb oil even at low temperature. In accordance with recent scientific research, spill propagation area as well as the mixture of light hydrocarbons in air will move to the shoreline in the case of disaster. Thus, oil spill technologies should be used not only in the open sea and in coastal water, but in offshore line as well.