



Editorial Column

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An overall level of technical development of human society is closely related to the assortment and quality of mineral resources used. The very names of the Stone, Copper and Iron Ages indicate the main and most important substances that were used in those times. Unlike in those periods, today the modern industrial society uses almost all elements of the periodic table. Owing to the development of mining and mineral processing technologies, the production of most of the elements became economically acceptable even on an industrial scale. Modern technologies of mineral processing and froth flotation especially give an opportunity to explore very poor resources. Froth flotation became a revolutionary mineral processing technology, which allows to produce most mineral components in industrial scale on very reasonable prices. Due to the development of this technology the most non-ferrous, rare and precious metals became widely available. During the last century this technology has become the largest industrial implementation of physical chemistry. In the world every day more than six million tons of various ores and raw materials are subjected to froth flotation. The process is extremely efficient. Only some decigrams of xanthate collector per ton of copper, lead or zinc sulfide ores usually gives an opportunity of almost complete recovery of the valuable minerals to the froth products.

Unfortunately existing technologies allow using only small part of valuable minerals. From the accumulated on the territory of Russia wastes three quarters fall to the mining industries. For producing of a ton of metal, it is formed from 30 to 100 tons of tails of beneficiation. For their removal and storage it is spent from five to eight percents of the costs of produced metals. The basic kinds of wastes are the rocks formed at extraction of valuable minerals, wastes of beneficiation of ores (mainly tails of mineral processing), and sewage and the gases accompanying development of deposits. The problem of wastes, especially the wastes of mining, has value of the key factor for maintenance of ecological safety of human society.

In this regard I want to point out that the modern view on the decision of the problem consists in the considering wastes of mining as new resources. It assumes, mainly:

- Perfection of the technologies of mining and mineral processing concentrating, development of the new methods of extraction of minerals from entrails and deep treatment of mineral raw materials, increasing of its comprehensive exploitation, that allows to reduce volumes of wastes
- It seems important for the development of the technologies of recycling of mining wastes, their processing with producing of the new kinds of products or diversification of mining manufacture
- The important point is the development of the technologies of handling of dangerous wastes with the purpose of their isolation and their output from biosphere processes.

Sustainable development, is it an illusion or a possible path? I very hope that it is and new materials, new technologies and reversible resources using could become the decision. Mineral resources usually are considered as irreversible resources. Preliminary planning gives all benefits to minimize the cost of exploitation of deposits and an impact factor of it. After maximal full and comprehensive recovery of

the valuable components it is of course necessary to provide complex reclamation of the disturbed lands. Possibilities to improve landscape after open mining, to create artificial lakes with fishing and recreation facilities, for example, give amazing perspectives.

Contra to an underground mining during an open mining there is often not necessary a lot of additional and preliminary works for providing security. For example by implementation of the open mining technology one can exclude catastrophic events which are connected with the technologies of underground coal mining such as unpredictable evolution of methane and carbon dioxide. In UK the worst single disaster in coal mining history was in the South Wales coalfield, when on the morning of 14 October 1913 an explosion at Senghenydd and subsequent fire killed 436 men and boys. In recent years, there are also many fatalities in underground coal mine explosions in which methane was a contributing factor. World's worst mining accidents of recent century occurred in Ukraine (19 November 2007, Zasyadko coal mine, Donetsk) with 80 fatalities, Russia (19 March 2007, Ulyanovskaya coal mine, Kemerovo) with 108 fatalities and China (14 February 2005, Haizhou shaft, Fuxin) with 214 fatalities.

I think that it is good idea to dedicate a special edition of the *Journal of Powder Metallurgy & Mining* to the problems of open mining. If you are funded an open access journal gives an opportunity to share your experience with a wide circle of colleagues not only from prosperity universities but also with perspective consumers of your knowledge in developing countries. Lord Thomas Dewar mentioned - "Minds are like parachutes: they only function when they are open".

I very hope that the *Journal of Powder Metallurgy & Mining* will become a suitable tribune for researchers and engineers interested in mining sciences and methods of comprehensive and ecologically safe recovery of mineral resources.

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