

ENVIRONMENTAL MINERALOGY RESEARCH IN CHINA

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Environmental mineralogy focuses on studying chemical behavior of minerals in the processes of natural and man-made environment, looking for technical methods and measures to prevent the environment from deterioration using mineralogical knowledge. At present, environmental mineralogy owns definite research goals: to explore the pollutants leading to environment pollution and to research the minerals that can eliminate pollution, employing some of their characteristics to transform and protect the environment.

Environmental mineralogy in mining industry

There are many ways of endangering human beings in coal mining: the vast amount of coal ashes and other harmful matters carried by ashes released during exploitation, the polluted water discharged from the pit and the harmful materials resulting from the leaching of dumps.

Coal mine dust pollution takes place mainly in the mines, directly damaging the workers' health (HAN, 1996). The mineral components in the dust, such as carbonates, quartz, clays, sulfides, silicates and other fine particles take key roles in producing pulmonary diseases, furthermore, the different mineral combinations can lead to various types of pulmonary damage.

Hazardous elements in minerals occurring in coal have been investigated in China (ZHUANG et al., 1999). Potentially toxic elements and some minerals entering the human body by means of exhalation, for example, will lead to abnormalities in metabolism and pathological changes. Due to their physico-chemical properties, minerals can cause different kinds of damages to human tissues. Thus mineralogical speciation is really important in preventing illnesses.

Treatment of Cr⁶⁺-bearing waste water using natural sulfide

Some waste water containing soluble Cr⁶⁺ ion was released endangering the environment. Sulfide was used to absorb Cr⁶⁺-bearing waste water (LU et al., 1997). At pH < 7, absorption efficiency increased.

The role of environmental mineralogy in protecting the environment

Many minerals have proved useful in reducing waste and dust pollution, deodorization and other aspects. The application of minerals in decontamination is mainly based on their adsorption properties. The mineral sorption agents usually used in curing waste water are tripolite, bauxite, zeolite, activated carbon, etc. With the development of technology, various kinds of new mineral sorption agents appear constantly. Moreover, some wastes are also utilized in decontamination, for example, slags can be modified to create absorption agents. Similarly, many minerals play an important role in curing waste gas. It can be ensured that environmental mineralogy, a new subject, will play an increasingly important role in protecting and curing the environment as it is developing.

References

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