

Environmental Mineral Materials

Lu Anhuai, \textregistered National Lab of Mineral and Rock Materials, China University of Geosciences, Beijing, 100083 \textregistered

The research on environmental mineral materials is developed in recent years. The basic properties including surface adsorption, porous filtration, ion exchange and heat effect as well as chemical solubility are key problems involved in the area. They can be widely applied to the harnessing contamination and renovating environment. The prospective investigation and utilization of them have been dealt with more detail by us with emphasis on the prevention and cure of soil contaminated by heavy metals, quality improvement and treatment of surface water and groundwater and collection of smoke and dust in burning coals. The Fe, Mn and Al oxides and hydroxides together with clay minerals in soil are favourable to adsorbing heavy metals in soil systems. Contaminated surface water and groundwater can be treated by natural minerals, especially those having properties of surface adsorption, ion exchange, porous filtration and chemical solubility. The metal minerals containing elements of changable valence, such as Fe, Mn and S etc., can be used as good reductants or oxidants to react with pollutants in waste water. The heat effect of natural minerals and their modified products are helpful to fixing sulfur dioxide and fine granular of carbon during burning coals. An outstanding example of nontraditional resource of sulfur is natural mineral of iron-bearing sulfide used for environmental mineralogical material. The chemical reductant of Na_2SO_3 is produced from mineral of FeS traditionally. When they are applied to reduct the pollutant of Cr from 6+ to 3+ value and form SO_4^{2-} , one molecule of Na_2SO_3 can only provide 2e from 4+ to 6+ value, while one molecule of FeS provides 8e from 2- to 6+ value. It means that one molecule of FeS is $8\text{e} \div 2\text{e} = 4$ times Na_2SO_3 in a point of view of mineral resource. The methods of pollutants disposal by natural minerals are reflected of natural self-purification in inorganic world v.s. by natural plants in organic world known very well.

Supported by the NSFC(49672097)