

## 某矿区土壤和地下水重金属污染调查与评价

Investigation and evaluation on heavy metal contamination in soils and groundwater of a mine zone

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中文摘要:

为了解湘南某矿区土壤和地下水重金属污染状况,对该矿区东河流域附近重金属污染源进行了调查,同时,对地下水和土壤样品进行了采样分析,结果表明:(1)该矿区东河流域附近的主要污染源有18个,其中有色金属选厂、尾矿库、采矿场和冶炼厂是排放重金属较多的污染源;(2)20个采样点中土壤重金属Pb、Cd、Zn、As和Hg大部分超过国家土壤环境质量标准(GB 15618-1995),综合污染指数 $P_{综}>1$ ,该矿区主要的重金属污染元素为Cd、As和Hg,且土壤中Cd、Zn和As的含量两两之间存在着极显著的正线性相关关系;(3)重金属元素在土壤中的纵向迁移不明显,该矿区附近20个采样点的地下水并未受到污染,综合污染指数 $P_{综}<<1$ 。20个采样点地下水Pb、Cd、Zn、As、Hg浓度均能达到地下水质量标准(GB/T14848-9)中的III类标准。

英文摘要:

In order to know the situation of heavy metal contaminated soil and groundwater near the mine zone in south of Hunan Province. An investigation of heavy metal sources of this area was carried out. At the same time, we sampled soils and groundwater around the East River basin in this area and analyzed the contents of heavy metals in soils and groundwater. The results showed that there were eighteen main pollution sources around the mine zone of the East River basin, including metal choose factory, tailing pond, mining field and smelter, which released more heavy metals. The contents of Pb, Cd, Zn, As and Hg in most of the 20 sampling points exceeded those of the soil environmental quality standard in China (GB 15618-1995). All of integrated pollution index of soil samples exceeded 1( $P > 1$ ). Cd, As and Hg were the major elements of heavy metal pollution in soils of this mine zone. Highly significant positive linear relations were found between any two contents of Cd, Zn and As in soils. There was not obviously vertical migration of heavy metals in the soils and the groundwater of the 20 sampling points around this mine zone was not polluted by heavy metals. All of integrated pollution index of groundwater samples were far less than 1( $P << 1$ ). The contents of Pb, Cd, Zn, As and Hg in the groundwater of all 20 sampling points were lower than those of the groundwater environmental quality standard in China(GB/T14848-9).

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