

Characteristics and Evaluation of Heavy metal Pollution in Soil and Near-surface Atmospheric Dust of Typical Mining Cities in Southwest China—A case study from Panzhihua city



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Citation: Liu et al., 2019. Characteristics and Evaluation of Heavy metal Pollution in Soil and Near-surface Atmospheric Dust of Typical Mining Cities in Southwest China—A case study from Panzhihua city. *Acta Geologica Sinica* (English Edition), 93(supp.2): 439.

Abstract: Taking Panzhihua City as the research area, the enrichment factor method, the potential ecological hazard coefficient method and the single factor index-Nemero comprehensive pollution index method were used to specifically target As, Cd, Cr, V, Zn and Ni and Cu in soil and near-surface atmospheric dust, and the pollution status of these seven heavy metals, was comprehensively evaluated. The results show that the average content of Cd, Cr, Cu, As, V, Zn and Ni in studying area is higher than the background values in Sichuan Province, because is located around the Panzhihua Smelter. It has been affected by steel smelting for a long time, and the amount of motorized diesel vehicles is large, and the demand for coal combustion is also large. Various pollution sources have had a negative impact on the local environment. The average content of Cd, Cr, Cu, Zn, Ni and V in Baoding coal mine area and Iron and Steel Smelting is higher than that of Sichuan Province. The heavy metals in the near-surface atmospheric dust also exceed the soil background value of Sichuan Province. The solid waste and the steel smelting are the main sources of heavy metals in the environment. The Enrichment Factors Index of heavy metals around Iron and Steel Smelting area mainly reach up to heavy pollution. The heavy metals in the near-surface atmospheric dust are also seriously affected by human activities, which may be related to the exhaust gas emission and steel smelting of diesel vehicles near the smelting area. The potential ecological hazard coefficient analysis indicates that the soil is in a strong to very strong ecological hazard. As far as the elements concerned, most of the elements are in minor ecological hazards, and the ecological hazard coefficient of Cd is the largest. The high RI worthy points are mainly concentrated in the vicinity of smelters and slag dump. Single factor index-Nemero comprehensive pollution index analysis, Cd, Cr and Ni pollution in Baoding coal

mine area is serious, the main source of these heavy metals may be from the coal mine waste or coal gangue. The pollution of Cd, Cu, V, Cr and Ni is more serious, indicating that iron and steel smelting has a serious impact on soil heavy metals.

Keywords: Heavy metals, Enrichment factor, Potential ecological hazards, soil

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