

Comparison of Official Test Methods for Soil Heavy Metals in Korea

**Dong Ho Kim · Tae Seung Kim* · Jeong Ki Yun · Jong Ha Kim · Hyuk Kim ·
Sung Hwan Jeon · Il Rok Chung**

*Soil and Groundwater Division, Environmental Diagnostics Research Department
National Institute of Environmental Research*

*e-mail : tskim99@me.go.kr

ABSTRACT

Two test methods, 0.1N HCl extraction and aqua regia extraction methods, are officially used in order to determine soil heavy metal concentrations in Korea. In this study, the concentrations of soil heavy metals(Cu, Pb) for various sites, for example, forest area(n=86), agricultural area(n=57), residential/leisure area(n=69), industrial/roadside area(n=58) in Korea were investigated.

The average concentrations of 0.1N HCl extractable heavy metals of 0.48 mg/kg Cu and 3.06 mg/kg Pb were found in the forest soil, 3.77 mg/kg Cu and 4.54 mg/kg Pb in the agricultural area, 2.55 mg/kg Cu and 3.52 mg/kg Pb in the residential/leisure area, and 3.13 mg/kg Cu and 4.49 mg/kg Pb in the industrial/roadside area, respectively. Also, the average concentrations of aqua regia extractable heavy metals of 15.26 mg/kg Cu and 18.43 mg/kg Pb were found in the forest soil, 24.45 mg/kg Cu and 21.38 mg/kg Pb in the agricultural area, 21.94 mg/kg Cu and 24.66 mg/kg Pb in the residential/leisure area, and 25.77 mg/kg Cu and 29.23 mg/kg Pb in the industrial/roadside area, respectively.

Correlation coefficients(r) of heavy metal concentrations determined by two test methods were 0.557 for Cu and 0.434 for Pb in case of total samples(n=272), and were significant(p<0.01). Correlation coefficients by land use were shown in the order of forest(r=0.65) > residential/leisure(r=0.63) > industrial/roadside(r=0.48) > agricultural (r=0.44) for Cu, and forest(r=0.70) > residential/leisure(r=0.56) > agricultural (r=0.35) > industrial/roadside(r=0.33) for Pb. From these results, the relationship between metal concentrations and r values were discussed.

Key words : Heavy metals, Korean official test methods, Correlation coefficients