

Heavy Metals in Coal Ash, Soil, Water and Sludge near the Two Coal-Fired Power Stations in Kosova

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Received June 28, 2011; Accepted August 20, 2011

Abstract: In this work we have determined the concentration of heavy metals in soil, water, sludge and coal ash, in the region of two coal-fired power stations “Kosova A” and “Kosova B”, in Kosova. We took samples near the two power stations and we have analyzed the concentrations of heavy metals with ICP-OES and AAS, in the June 2010. Soil and coal ash samples were taken in the area with high indication of pollution, notably to the villages which are located near the power stations. In coal ash, we found that the concentration of heavy metals were: Pb 0.00-5.90 mg/kg, Zn 14.60-14.63 mg/kg, Cu 8.40-9.40 mg/kg, Cd 0.00 mg/kg, Fe 11940.00-12040.00 mg/kg and Ni 34.50-36.78 mg/kg. The concentration of heavy metals in soil, near the river Sitnica, differ as following: Zn 153.90-312.00 mg/kg, Pb 134.8-160.00 mg/kg, Cu 3.20-82.00 mg/kg, Cd 0.00 mg/kg, Fe 14290.00-15215.00 mg/kg and Ni 9.88-120.21 mg/kg. Samples for water analysis were taken in five different positions in the river Sitnica. The concentration of heavy metals in water were: Pb 0.03-0.10 mgdm⁻³, Cd 0.00 mgdm⁻³, Zn 0.01-0.04 mgdm⁻³, Cu 0.00-0.01 mgdm⁻³, Fe 0.00-0.15 mgdm⁻³ and Ni 0.001-0.12 mgdm⁻³. In sludge of the river Sitnica, the concentration of heavy metals were: Pb 11.56-438.00 mg/kg, Zn 51.00-264.00 mg/kg, Cu 1.80-33.80 mg/kg, Cd 0.00 mg/kg, Fe 10259.00-16060.00 mg/kg, and Ni 7.00-14570.00 mg/kg. According to the experimental results obtained in this work we can conclude that coal ash of the two coal-fired power stations in Kosova, are charged with heavy metals. These metals can penetrate from coal ash to the environment area and will have an influence on the contamination of water, sludge and soil. From these results we have found that the concentration of heavy metals in these environmental areas (water, sludge, soil and ash) was higher compared to the standards for water, soil, sludge and ashes of coal-fired power stations.

Keywords: *Heavy metals, Coal Ash, Coal-Fired Power Stations, Sitnica River, Water, Soil, Sludge, Kosova.*

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