Air pollution generated by industrial activities and its impacts on agricultural soils of Annaba region

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Purpose. Environmental pollution by toxic metals arises from industrial, agricultural effluents and waste disposal from various sources. Many industries such as metal plating facilities, mining operations and tanneries discharge waste containing heavy metal ions. Heavy metals are not biodegradable and can lead to accumulation in living organisms, causing various diseases and disorders. It is well known that some metals are harmful to life, such as antimony, chromium, copper, lead, manganese, mercury, cadmium, etc.; they are significantly toxic to human beings and ecological environments. **Methods.** The main components of receipt of harmful substances into the atmosphere are emissions from high-temperature combustion products (exhaust gas vehicles, aircraft, industrial emissions and thermal power plants). Knowing the quantities of certain substances released into the atmosphere is a necessary and fundamental step in any environmental protection policy, which deals with current problems such as acidification, degradation of air quality, global warming and climate change, stratospheric ozone depletion, etc. This quantification, which is usually called "emission inventory", is carried out using specific rules that may vary from one inventory to another. On an international scale, harmonization work has been underway for several years between various international bodies (European Commission, United Nations Economic Commission for Europe, Intergovernmental Panel on Climate Change [IPCC, IPCC], EUROSTAT, International Energy Agency, etc.). This work is continuing together with the improvement of methodologies for estimating releases from various types of emitters. **Results.** The average emission rates of atmospheric discharges from process dust collectors DEP-1 old system and DEP-1 new system are of the order of 0.11 and 0.04 g /Nm^3, which represent a percentage of 72% and 28% atmospheric emissions. The present research was conducted to determine the features of heavy metals absorption by soils collected in Annaba. Wherefore the soil absorbency to heavy metals was assessed by plotting the isotherms and determining the maximum absorbency. In the top 5 cm layer of soil sampled in different areas of the city Annaba, the pH of the aqueous extract is in the range 8.0-8.6, and humus content in the range 1.2-4.45. The greatest value of the sum of exchangeable bases recorded in two districts of Annaba (Sidi Amar and airport). **Conclusions.** This work is part of the major current issues dealing with atmospheric emissions related to industrial activities in a mining context. The objective is to describe the origin of its emissions and their impacts on the environment, health and agricultural soils. The environmental study of atmospheric dust emissions in the steel complex of El Hadjar and in particular, around the agglomeration unit (PMA) shows that the material released consists of a mixture of re-mobilized local siliceous and ferriferous dust by wind deflation. The chemical composition of the dust emitted by the chimney of the AGII as well as that deposited on the installations and the roofs are characterized by a high iron and silica content. These findings could play a key role to effective assessment of soil pollution with heavy metals in the study area.

***Keywords:** adsorption capacity; heavy metals; metallurgical industry; evaluation; man-made pollution.*

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