

SPATIAL DISTRIBUTION AND CONTAMINATION OF HEAVY METALS IN SOILS OF ARZEW ALGERIA

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Introduction

On ARZEW the region (Algeria) is one of the largest oil industrial zones in Africa The city of ARZEW is a recent town that lies within the Natural Gas Liquefaction fields. It is one of the intensely affected by soil pollution from industrial regions, particularly by hydrocarbons and heavy metals. Large-scale oil refinery, liquefaction natural gas and related industrial activities can release significant amounts of heavy metals. An increase in pollution by heavy metals in soils Arzew due to industrialization and intense urbanization has become a serious environmental problem.

The aim of the thesis is to determine the concentration and spatial distribution of heavy metals in the surface soil of Arzew to identify their sources and assess their levels of contamination.

Soil samples from 54 sampling sites in roadside in Arzew were collected and analyzed

Methods

The region of Arzew is one of the largest oilfield in Algeria wish is located at the West of Algeria on the plateau of El Mahgoune two kilometers from the city of Arzew and about 40 kilometers east from the city of Oran and at 400 km from Algiers the oil field of Arzew extends over a surface of 150 ha The ressources in gas and oil were exploited there for more than 50 years with The Arzew refinery processes 3.5 million tonnes per year of crude oil

A total of 54 topsoil (0-20 cm) were collected from different main functional sections in four zones of Arzew including 25 were collected from roadside 14 from residential region 07 from agricultural area 08 from industrial area.

Sieving soil 0.2mm and mineralization of 50 samples in aqua regia (7ml hydrochloric acid and 3.5ml of nitric acid)

Solution analysis by ICP spectrometry inductive coupling plasma atomic emission (ICP-AES) using a Jobin Yvon JY2000 Ultra Trace spectrometer according to DIN EN ISO 11885.

The measurement parameters of ICP-AES are summarized below:

- Power: 1000 pump speed: 20 ml / min, plasma gas flow rate: 12 L / min flow gas vector: 0.2 L / min, nebulizer flow rate: 0.83 L / min, nebulizer pressure: 3.1 bar

Results:

Table 1: Heavy metal concentration in urban soils in the Arzew City

Métaux lourds	Concentration mg/kg		
	Min	Max	Moy
As	0.48	16.41	09.25
Co	04.09	14.84	09
Cr	16.63	84.42	47.85
Cu	08.10	67.13	19.68
Ni	09.83	42.13	23.20
Pb	23.81	149.58	56.48
Zn	41.10	164.88	74.01

Conclusion

A total of 54 soil samples collected at the roadside of the Arzew area were analyzed. Arzew contaminated soils with Pb due to the high traffic and As, Cr and Ni due to the immense industrialization in the region.

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