

## Determining the Contamination in Soil by Heavy Metals for Some Zones in Baghdad City

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### Abstract

The aim of this paper is to determine the contamination of soil by heavy metals for agricultural soils in some zones in Baghdad city and chemistry analysis of those samples of soils in the laboratory using a device (ICP-MS) technique.

**Keywords:** Contamination, Organic & Inorganic Pollutants, Heavy metals, Cadmium (Cd), Lead (Pb), Nickel (Ni), Copper (Cu), Zinc (Zn).

### 1. Introduction

Those plants need heavy metals in quantities or specific ratios that increased from those ratios, the impact would be detrimental to the plant and thus on human, animal and there are some metals that are not needed for germination in construction, such as lead and cadmium process.

Explained with heavy metal in soil and harmful to the plant and human and how to deal with it [1]. In the city of Dar es Salaam in Tanzania study was conducted to contamination of agricultural soils and water with heavy metals [2]. and the contamination of agricultural soils with heavy metals and its impact on plant and central zones of Korea [3]. And also another study in China for heavy metals pollutants in urban soil and dust on urban and agricultural roads over the past 10 years [4]. and in the western part of the region Nahrawan (eastern Baghdad) conducted a study on pollution soils with heavy metals and the effect of depth to it being a container on the bricks coefficient and the effect of these plants on the soil [5].

### 2. Agricultural Soil Contamination

Agricultural soil pollution is defined as "corruption, which affects soil alter the characteristics and natural properties, chemical or bio to make them negatively, directly or indirectly affect the lives above the surface of human and animal and plant" and stop pollution of agricultural soil pollution type, recipes earth, climatic conditions and natural factors. The immediately be such as earthquakes, volcanoes or imperceptibly such as excessive use of pesticides and mineral fertilizers and re-use of wastewater to irrigate the land [6].

### **3. Types of Pollutants Agricultural Soil**

#### **3.1.Organic Pollutants Include**

1-cyclic aromatic hydrocarbons and confiscation of:

- \* Burning of coal, oil and wood.
- \* Asphalt.
- \* Coal tar.
- \* Emission car exhaust - grease.

2- Nitro aromatic.And sources (bombs - insecticide - bacterial insecticide).

3- Phenols and Anilines. And sources (bacterial pesticides - Exchange factories - materials Tale- pesticide materials water weeds).

4- Aromatic halogens. . And sources (herbicides - incineration of medical waste and solid waste and hazardous waste - the burning of oil, coal and tires - lead mines).

5- Aliphatic halogens. . And sources (plastic industry).

6- Pesticides. And sources (agriculture - pesticide industry).

7- Petroleum products. . And sources (oil refining industry - automotive and transportation – Industry)[6].

#### **3.2. Inorganic Pollutants Include**

- heavy and trace metals.
- Nitrogen

### **4. Materials and Methods**

#### **4.1.Soil Samples**

In this paperwe take soil samples at a depth (0-20)cm included different zones of the province Baghdad.

These samples were collected and analyzed in the laboratory using a device ICP-MS technique to see the content of heavy metals as shown in Tables 2, 3,4 and 5. The standard parameters adopted for the year 1979 of natural concentrations heavy metals in the soil which gave in Table 1[7].

Table 1: the international concentrations of heave metals (mean) in soil (Lindsay, 1979) [7].

	Pb	Ni	Cr	Cu	Cd	CO	Fe	Zn	As	B	V
Inter. mean in soil (Lindsay, 1979)	10	40	100	30	0.06	8	38000	50	5	10	100

## 4.2.Mathematical Analysis of the Results

We see from the results of the concentrations of heavy metals gave in the Tables (2, 3, 4 and 5) the following:

1- For sporadic agricultural zones of Baghdad

Increase in cadmium normal as shown in Table 2 and Figure 1 for nickel, there was variation in the concentration and reached the highest concentration of his farmland in the Shaab district, amounting to 67.5 mg/kg and the amount of the increase from the normal 27. 5 mg/kg.

The highest lead concentration has reached the farmland zone of Mahmudiya 95 mg/kg and where the amount of the increase from the normal rate of 85 mg/kg.

But the zinc has the highest concentration in the farmland zone Obeidi was 135 mg/kg the amount of the increase for the natural rate stood at 85 mg/kg.

## 5. Conclusion

Chemicals analysis for agricultural soil to determinate the pollution in some zones in Baghdad city is presented. Then testing different samples of agricultural soils of different regions of Baghdad to see its concentrations from heavy metals and showed the difference in the concentration of heavy metals.

<b>samples</b>	<b>Zn</b>	<b>Pd</b>	<b>Ni</b>	<b>Cd</b>
Agricultural Land KasrawaAtash	<b>8.35</b>	–	<b>28.85</b>	<b>0.15</b>
Agricultural Land NasebAlshaheed zone	<b>52.5</b>	<b>15.65</b>	<b>14</b>	<b>0.7</b>
Agricultural Land Zafaraniyah zone	<b>9.7</b>	<b>5.9</b>	<b>9.85</b>	<b>0.9</b>
Agricultural Land Rashidiya zone	<b>15</b>	<b>6.3</b>	<b>47.75</b>	<b>0.4</b>
Agricultural land Mahmudiyah zone	<b>130</b>	<b>95</b>	<b>38.8</b>	<b>3</b>
Agricultural land Abu Ghraib zone	<b>37.7</b>	<b>12</b>	<b>20.5</b>	-

Agricultural Land in Zuwarah Park	<b>20</b>	<b>10.4</b>	<b>43.5</b>	<b>0.8</b>
Agricultural land in al-Obeidi zone	<b>135</b>	<b>18.35</b>	<b>25.6</b>	<b>0.05</b>
Agricultural land Shaab zone	<b>30.5</b>	<b>17.5</b>	<b>67.5</b>	<b>0.3</b>

Table 2:Represents the results of laboratory tests of soil samples taken for some zones in Baghdad

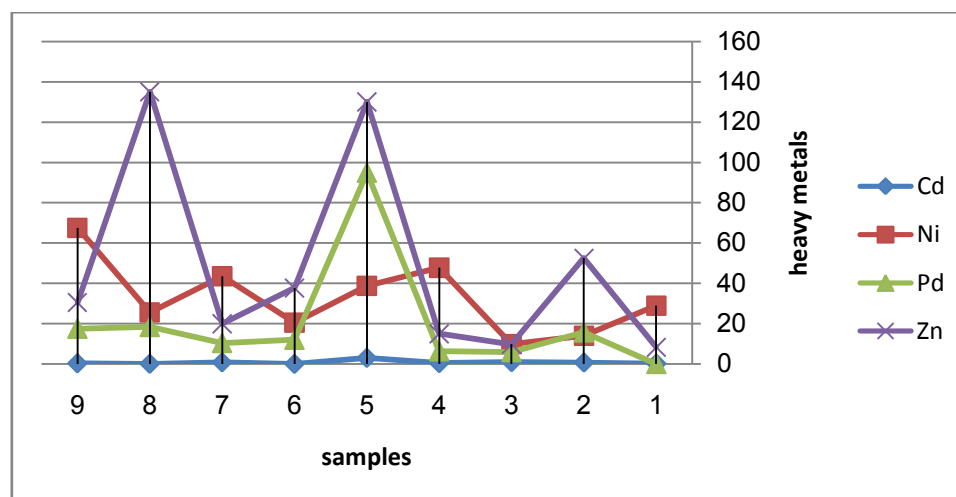


Figure 1: Heavy metals tosomeAgricultural lands for Baghdad

Table 3: Represents a laboratory analysis of soil samples taken from the farmland ofQanat Al jaesh

Samples	Cu	Zn	Pd	Ni	Cd
State 1	10	24	18.8	62.5	0.2
	4.25	9	11	12.5	0.1
State 2	8.5	14.5	11.6	57.5	0.1
	6	14	10	47.5	0.1
State 3	10	16	4.8	27.3	0.1
	9.2	16.1	3.45	25	0.1
State 4	8.6	15	24.05	43.5	0.6
	8.7	10	10	13.75	0.35
State 5	0.2	0.8	2.25	36.5	0.25
	5.5	11.2	8	36	0.45
Average	7.46	14.06	12.3	45.46	0.25
	6.73	12.06	8.49	26.95	0.22

Table 4: Represents a laboratory analysis of soil samples taken from farmland in Jadriya city

Samples	Cu	Zn	Pd	Ni	Cd
State 1	12.5	85	12	55	0.2
	12	32.5	10	37.5	0.2
State 2	8	9.5	10	20.5	0.05
	7	7	8	13	0.05
State 3	8.5	11	11	26	0.05
	10.5	14.5	10	13	0.05
State 4	17.5	15.5	17.5	27	0.05
	12.35	10	10	54	0.6
State 5	9.35	10	13	54	0.75
	12.6	12.5	11.5	55	0.8
Average	11.17	26.2	12.7	36.5	0.22
	10.89	15.3	9.9	34.5	0.34

Table 5: Represents the results of laboratory analysis of soil samples for farmland in Zafaraniyah city

Samples	Cu	Zn	Pd	Ni	Cd
State 1	9.5	25	34.5	52	0.25
	6	10	6.1	55	0.15
State 2	11	18.8	9.7	66	0.7
	12	25	8.8	80	0.2
State 3	4.0	18	7.65	9.5	0.65
	1.00	7	2.75	2.5	0.1
Average	8.167	20.6	17.283	42.5	0.533
	6.333	14	5.8833	45.833	0.15

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