INTRODUCTION

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Environmental pollution is considered one of the most serious problems facing mankind in the 20th. century. Pollution is defined as any change in the physical, chemical, or biological condition of the environment which may harmfully affect the quality of human life including effects upon animal and plant. Pollution by chemicals is one of the most effective factors in the distruction of biosphere components. Among all chemical contaminantes, trace elements and heavy metals are believed to be of a specific ecological, biological, or health significance.

Heavy metals originating from various sources, i. e., sewage effluents, industrial wastes, motor vehicle exhaust fumes and the industry fall-out finally reach the surface soil, and their further fate depends on soil chemical and physical properties. Although the chemistry of soil contaminants has been the subject of many recent studies, our knowledge of the behavior of polluting heavy metals is far from complete. The input-output balance of metals in soils shows that heavy metals concentrations in surface soil are likely to increase, on a global scale, with growing industrial and agricultural activities.

Knowledge of the total content of metals in soil provides only limited information about their chemical behavior as they are present in soil in different forms with varying degree of mobility and availability to plants. The environmental effect of heavy metals is, thus, related to the level of the various forms and the rate with which the less mobile forms are transferred to the more mobile ones.

Precise separation of heave metals in soils into all specific chemical forms is not possible with current analytical procedures. However attempts have been made for partition solid phase metals into chemically similar forms through the use of sequential extractions with selective chemical reagents.

Irrigation of crops with sewage effluents has been practiced in Egypt for a number of years. The disposal of waste water posses serious problems for pollution control, at the same time, the increasing water demand for agriculture has raised interest in the maximal re-use of sewage water, and a large areas in El-Gabal El-Asfar utilize sewage effluents. However, sewage effluents contain heavy metals that may accumulate in sewage irrigated soils in many forms.

The objectives of this study were to investigate (i) the effect of using sewage effluents and industrial waste water in irrigation on the physical and chemical properties of soil and its content of Cu, Zn, Pb, Cd, Ni and Co, (ii) the effect of industry fall-out drived from some chemical plants and smelters on the status of selected heavy metals in neighboring soils, and (iii) the effect of motor vehicle exhausts on the total and forms of heavy metals in the roadside soils.