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Heavy Metal analysis in Soil Samples of Heavy traffic zones of Hyderabad, A.P

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Abstract: The presences of heavy metals in the soil sediments are analyzed with respect to the pb. Lead in the soil sediments results mainly from the dry and wet deposition of atmospheric pb, particularly close to emission sources. The soil samples collected from the Mettuguda traffic signal area, Sitafalmandi signal area, parking area of Sitafalmandi and near railway tract of Sitafalmandi uppal and Tarnaka. The sampling areas of traffic signals were those along major through fare within the city have high traffic density and the regular routes of cars, buses, trucks, cycles, passage jeep and other motorized vehicles.

Key words: Contamination, vehicular emissions, Alumina sheets

INTRODUCTION

Soil constitutes the upper part of the earth's crust with weathered material or organic matter as main constituents, on which plants are growing and in which organisms are living. It is an extremely dynamic and complex system exhibiting continuous interplay between soil - and between living and non-living components. Contamination of soil is seriously problem especially in country as densely

populated as India. Rapid urbanization and industrialization have augmented the growing burden of chemical contaminants upon the soil[1-5]. The steep increase in population demanded abnormal rise in transportation availability of transport vehicles such as road and rail are sure sign of economic progress of any country. The heavy metals introduced into the environment through so many sources, which include, decomposition of fossil fuels, smelting, glazing and electroplating etc[6-9].

 Some heavy metals like As, Cd and Pb have been reported to have no known bio-importance in human biochemistry and physiology and consumption even at very low concentrations can be toxic. However, behind the boom of development there is a cause of pollution. Due to steep increase in usage of automobiles in the cities, the people forced to see traffic jams in various cities. The people are forced to use brakes, due to continuous breaking in many parts of the city; roadside sediments have high levels of copper and zinc. This study assumed that elevated levels of lead in urban soils are primarily the result of air released into the atmosphere. Primarily through vehicular emissions. Considering that factor, the soil samples are collected and analyzed[15-28].

MATERIALS AND METHODS

Field site: Soil samples collected from the selected sites of urbanized places of Mettuguda and Sitafalmandi of Hyderabad and Secunderabad respectively. The samples collected from the parking lot of Sitafalmandi, Station near the traffic signal tack of Sitafalmandi. The sample also collected near junction of road traffic signal of Mettuguda, Uppal and Tarnaka. The sampling areas of traffic signals were those along major through fare within the city have high traffic density and the regular routes of cars, buses, trucks, cycles, passage jeep and other motorized vehicles. Description of Sitafalmandi area and Mettuguda area with reference to population, rough estimation of vehicles and number of vehicles in parking area and number of trains per day near railway track of Sitafalmandi station, Map of Sitafalmandi area and Mettuguda area.

Soil Sampling: The soil samples collected from the Mettuguda traffic signal area, Sitafalmandi signal area, parking area of Sitafalmandi and near railway tract of Sitafalmandi. The top soil samples collected from six places and the soils mixed to get a composite sample. The samples collected in polyethylene bags and shifted to the laboratory. The soil samples are collected on a working day at 5 p.m. – 5.30 (highly dense traffic day) and they are collected in the evening which has the maximum vehicles at that time.

Treatment of Soil Samples: Samples from the selected sites obtained approximately 2 to 3 meters from the road without removing the top soil approximately 1 kg of soil collected with the use of garden trowel. Sampling depth was about 15 cm and 12cm diameter. The soil samples mixed on Alumina sheets and plant residues air dried for over 6 hours and over dried for about 2 hours and completely sieved.

Sample preparation, digestion and analysis: A 2 gram of air-dried soil sample placed in a digestion sample 40 ml of digestion solution (DTPA). The mixture allowed to stand 4 hours inside the hum hood and subsequently digested at about 100c until the digest was clear. Automatic absorption spectrophotometer used to determine the presence of copper, zinc and lead in the soil samples.

RESULTS & DISCUSSION

The presence of heavy metals in soil sediments is in and of $Zn > (\mu)$ pb. Soil sediment analysis indicates that the presences of heavy metals in the soil sediments are analyzed with respect to the pb. Lead in the soil sediments results mainly from the dry and wet deposition of atmospheric pb,

particularly close to emission sources. Atmospheric pb comes mainly from the combustion of gasoline containing tetra alkyl lead anti-knock agents. During fuel combustion pb compounds (lead chlorides and bromides) consequently formed are relatively volation and allow 70-75% of gasoline to be emitted into the atmosphere with exhaust fumes.

Theses inorganic pb salts are emitted as very small particles of approximately 0.02 ln aerodynamic diameter, which are considered to increase in size rapidly in the atmosphere by coagulation with other particles leaded gasoline usually contains 0.15 to 0.40 g of pb per liter and unleaded contains less than 0.01 g pb per liter. Exhaust fumes may contain 1000-2000 µg of pb per cubic meter when leaded study the pb content in the soil sediments is above the back ground values but there not very high.

Table – 1: Heavy Metals present in soil sample of traffic signal area of Sitafalmandi and Mettuguda

S. No	Parameter	Units	Sitafalmandi	Tarnaka	Mettuguda	Uppal
01	Lead (Pb)	ppm	0.47	0.97	0.40	1.25
02	Copper (Cu)	ppm	1.96	3.67	2.26	3.56
03	Zinc (Zn)	ppm	2.42	7.89	3.12	4.36

CONCLUSION

The presence of heavy metals in soil sediments is in and of Zn> (µ) pb. Lead in the soil sediments results mainly from the dry and wet deposition of atmospheric pb, particularly close to emission sources. As the areas under study are aware of toxicity of pb there are using unleaded petrol for their vehicles the contamination of soil sediments is less. Copper is the common substance that occurs naturally in the environment and spreads throughout the environment air remains for a long period before it settles for a long period before it settles when it starts to rain Cu compounds bound to either water segment solid particles. Cu attaches strongly to organic matter and minerals. Cu is common in the environment Cu compounds are strongly attached to dust and dirt imbedded in minerals Cu reduces the risk of lead poisoning. It causes oral and dental dose less than RDA. Andhra Pradesh Government on the advice of pollution control board campaigned against the usage of unleaded petrol to improve the urban environment

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