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LEAD CYCLE IN THE ENVIRONMENT POLLUTION



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ABSTRACT:

Pollution of Lead has been a problem which has been involving in air, water and soil. It is more rapidly in the air than in soil or water. The natural background of lead and its compounds in air must be very low due to low vapor pressure values. Lead emissions into the atmosphere have been of two types namely particulate and gaseous compounds.

Toxicity of lead is very wide ranging and includes impaired blood synthesis, hypertension, hyperactivity and brain damage. Interference of hemoglobin synthesis. It binds strongly to a large number of molecules such as amino acids, enzymes, r.n.a, d.n.a, hemoglobin. It disrupts many metabolic pathways. The widespread distribution of Pb from motor vehicle exhaust increases atmospheric level. The subsequent contamination of soil and crops increases the amount of lead in food it absorbs more in kids, less in adults which causes acute poisoning, chronic poisoning, mental functions, intelligence of children's is being lowered in urban area in which there is high input of Pb from motor vehicles. Therefore, the author has desired to represent how the lead is effective & causes ill effects to human life and environment.

KEYWORDS

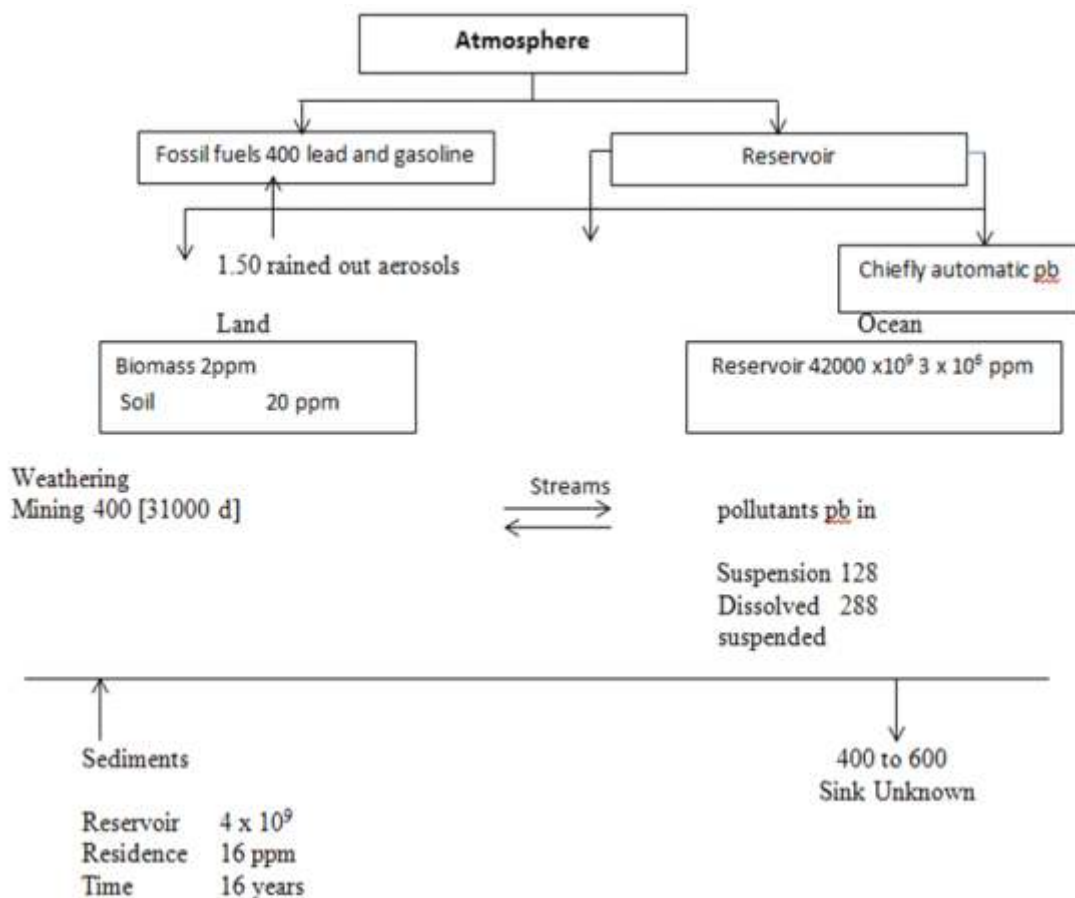
Environment, Biomass, soil, Lead, Toxicity, Emission, Hyper Tension, Hemoglobin, amino acids, R.N.A, D.N.A, Vapour pressure, Solubility Product, Electronic Configuration, Pollution Adsorbent.

1.1 INTRODUCTION:

Lead is relatively abundant metal in nature occurring in lead minerals when leaded gasoline undergoes combustion in automobiles, lead in the form of tetra methyl lead, tetraethyl lead is produced. The substance enters in to the atmosphere produced. The substance enters in to the atmosphere and brought down on earthy by rain and then enters in to the nature compounds like Lead Chloride, Lead Bromide $PbBrCl$, PbO , PbS , $PbSO_4$, $PbCO_3$, $Pb(C_2O_4)_2$, $PbNO_3$, $PbNO_2$...etcare originated from lead-minerals also enters into water $Pb(OH)_2$ gets its energy in to natural water from lead pipes in common with other particulate pollutants, lead is removed from the atmosphere by wet and dry deposition process, as result of street dust of road side soil become enriched with Pb with concentrations typically of the order of 1000 400 $Mg\ Kg^{-1}$ on busy street, intake of lead in diet approximate 200 to 300 Mg per day and it is saturated in bone (200 Mg) in every day. Peoples use river water mainly heavy-metals like Hg, Zn, Cu, Cd, Pb, Cr, Ni, Mnetchave been considerably increased during the last few decades and pb is one of them, toxicity of these metals their concentration must be reduced to very low extent prior to their entry in to natural source, applying various industrial osmosis, ion exchange and activated Carbonadsorption method.

1.2 FLEW CYCLE OF LEAD IN THE ENVIRON MENT:-

How the lead polluted in the universe is represented by using the following chart:



It causes hazards effect in the environment.

TIXCITY OF LEAD [PB]

The major biochemical effect of lead is interference with heamesynthesis which leads to hematological damage. It inhabits many key enzymes involved in overall prices of heame synthesis where by metabolic intermediate accumulate one such intermediate is 's' aminolovulinicacid conversion of 's' aminolovulinicpronphoricacidbilynogen is one of the important phase of heame synthesis.

Adsorption of lead has been found to vary with age and is affected of absenceof food and hardness of water, once adsorbed it passes into blood system where more than 95% is bound to erythrism cysts causing increased fragility and reduced life span of the cell. The overall effect is the disruption of synthesis of hemoglobin as well as of the respiratory pigments such as cytochrome which require heame and lead does not permit utilization of oxygen and D (d) dextrose for life sustaining energy production.

The permissible limit for led in drinking water approved is 100mg/cm² (W.H.O). Directed termination of lead on venous and capillary blood is the most widely used assessment of lead in the body.

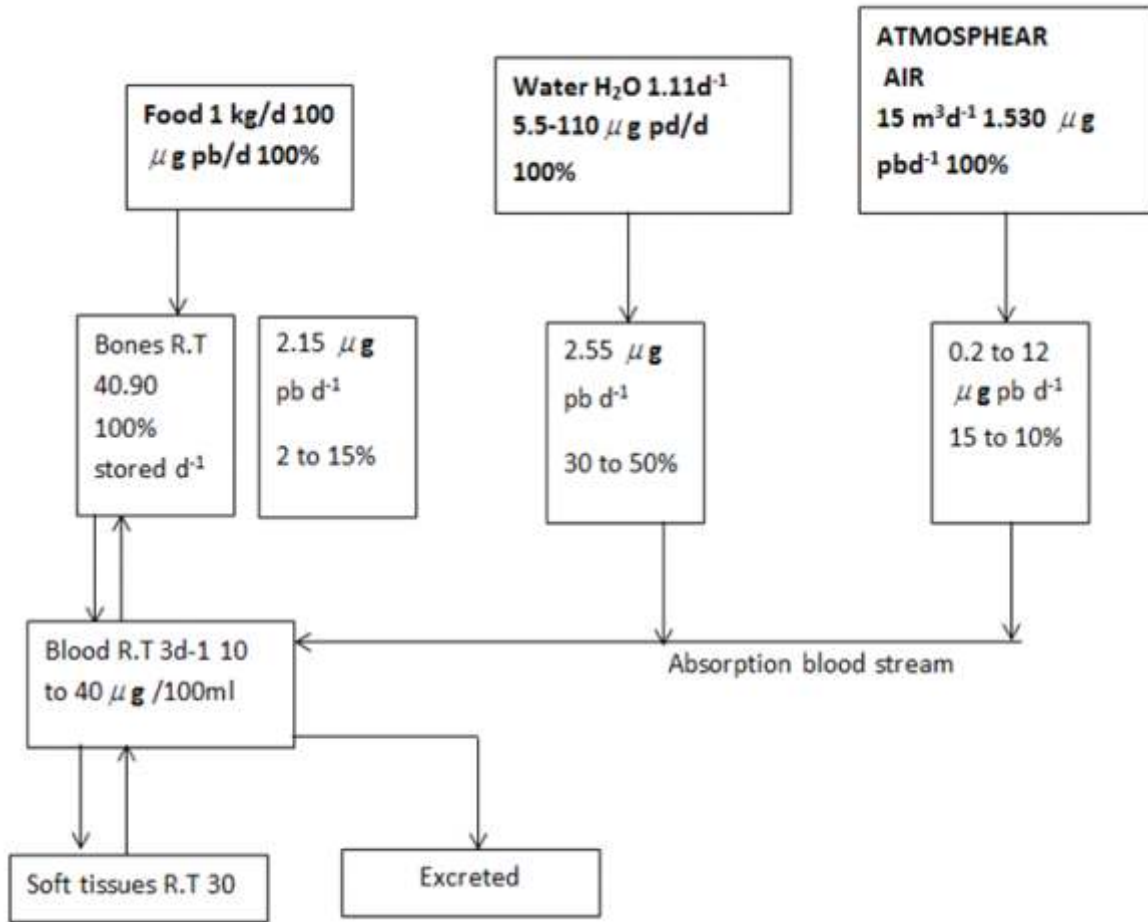
The average male body burden has been quoted as 165mg occupationally exposed workers accumulating up to 566 mg become of chemical similarities between pb⁺² and cu⁺² bones serves as a reeve as repository for lead accumulated by body.Later pb may be remobilized along with po4 from the bone has toxic-effect. A cute or classical lead poisoning manifested by fatigue, head ache through convulsion, cerebral palsy, blindness and metal retard action, renal damage,etc.

(I) LEAD IN AQUATIC SYSTEM:

The behavior of lead in natural water is a combination of complexion with organic and inorganic ligands and equilibrium of recitation.

The removed of lead and waste water by adsorption [adsorbents like flyash, china clay and their composition-fly ash: SiO₂=58.04%, Al₂O₃=25.50%, Fe₂O₃=3.50%, TiO₂=1.10%, CaO=2.00%, Na₂O=0.83%, MgO=0.64%, K₂O=0.83%, Cl=0.83%, P₂O₅=0.80%, Chainaclay:- SiO₂=45.93%, Al₂O₃=38.13%, CaO=0.85%, Fe₂O₃=0.65%, MgO=13.45%]

(II) DAILY IN TAKE OF LEAD BY ADULT HUMANS AND ITS DISTRIBUTION



- Bones acts major reservoir of lead in the body and the residence times 40 to 90 years in adults.
- Lead has low solubilities.

1.6 Pb COMPOUNDS IN AUTO EXHAUST IN 18 HRS, AS GIVEN BELOW:

Sr. No	Lead compounds	% of total lead particles counted in exhaust	
		Zerotime	After 18 hrs.
1	PbBrCl	32.0	12.0
2	Pb BrCl2pbO	31.4	01.6
3	Pbcl2	10.7	8.6
4	Pb(OH) cl	7.7	7.2
5	Pb Br2	5.5	0.5
6	PbCl22pbO	2.2	21.2
7	Pb (OH) Br	2.2	0.7
8	PbO	1.2	21.2
9	PbCo3	1.1	13.8
10	PbBr2 2pbO	1.09	0.1
11	PbCo3 2pbO	1.0	29.6

- The contribution of gasoline combustion to atmosphere Pb pollution the other source should not over loaded and contributes less percentage of the total lead pollution.
- Lead containing ceramic glazes has been a serious source of the lead poisoning when used on

containers for food stuffs. It has been found in highly acidic liquids namely apple juice may be dissolve the glaze, release lead into the liquid if the glaze is not properly formulated and applied.

- Children's between the age of 1 to 6 years from eating and flaking paint causes lead poisoning and becomes main victims.
- Chemical form of lead affecting its biological behavior in the body.

1.7 CONCLUSIONS:

- Lead disturbs many metabolic pathways
- Toxicity of lead is wide ranging and includes impaired blood synthesis, hyper tension, hyper activity, drain damage, interference of haem synthesis
- It causes motor-vehicles exhausts increases atmospheric levels.
- Lead adsorbed primarily through the gastro intestines and respirator tracts.
- Tetraethyl lead readily adsorbed by the body through the skin or mucous membranes, which causes serious problems for small age groups [1 to 6 years] of occupationally exposed workers, inter layer of h-bonding observed in chain clay, flash used as good adsorbents.
- It is used in ceramic glass as litharge pbo added it gives the final glaze attractive properties unattainable with other oxides.
- Lead poisoning can be cured by treatment with chelating agents which strongly covalent with Pb^{+2} [chelates are $Mn^{+2} < Fe^{+2} < Co^{+2} < Ni^{+2} < Zn^{+2}$] the order of electronegativity.
- Cu(1.9), Pb(1.8), Ni(1.8), Co(1.8), Cd(1.7), Zn(1.6), Mn(1.5),
- Gaseous emission are generated primary by the combustion of gasoline additives (tetra ethyl 62%, tetra methyl leads 18%, ethylene bromide 18%, ethylene-dichloride)
- Lead contain in lend is agriculture 02 to 80 %, improved pasture forest 04 to 1.5%, 10 to 30, general restricted 140 to 500, 66 x 60.
- Lead used in cosmetics pigments, paints, photography, fuels, automotive products.
- Due to rapid growth of industries for mankind posed a serious threat to the vast and varied resources of the world.

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