

Lead trial

[Science](#), [Chemistry](#)



INTRODUCTION

Lead is a type of metal that is extremely toxic. It is used in the industries for the manufacture of various products like paint, gasoline etc. The chemical is also a component of products like ammunitions and batteries. Lead is a problem because of its dangerous and irreversible hazards. In the industry for instance, workers who are in constant touch with paints and gases stand a high risk of illness as a result of this chemical. It also poses danger especially on children whose weak bodies become vulnerable due to the devastating effects of lead. The control of lead levels and exposure to materials containing the chemical is inevitable. But with the application of the OSHA standards, it is anticipated that employees would not find their way into contact with this material. These standards require that employers should make their workplaces free of lead and other hazardous materials.

Background

Lead is a bluish chemical (when fresh) but grey (when exposed to the atmosphere). Its usage traces back to more than 6000 years. The metal does not easily rust and is also a poor conductor of electricity. It is found in the earth's crust as an ore together with their metals like copper and zinc.

Exposure to lead can lead to the damage of the nerves. It can also contribute to kidney problems especially nephrosis. Besides this, the chemical is also believed to be one of the greatest contributors to brain damages and also blood disorders. In children, an even low level of lead in their blood is

harmful. It can cause retarded growth, IQ problems and hearing problems. It can ultimately lead to death of the infant.

Sampling methods

In order to find the lead levels in humans, sampling is carried out. Various methods are used like OSHA, MOSH, etc.

THE OSHA METHOD OF SAMPLING LEAD

This method incorporates filters that have got sampling pumps. After collection of these samples, analysis is done through emission spectrometry or flame atomic absorption.

Detection of specific metals can be through minute or bulk quantities.

Tetramethyl and Tetraethyl compounds of lead can be analysed using In-House method as the stop gap procedure.

Advances in techniques and different levels of exposure limits may render a given OSHA method inapplicable.

The first step in analysis is to make bulk particles lesser i. e. grinding, or crushing to powder form. The samples are mixed with strong acid concentrates or if possible using de ionised water. The sample solution is then diluted, and exposed to atomic absorption or spectrophotometer rays.

Through the measure of characteristic wavelength, it is possible to determine the element but after atomization and achievement of the excited stage of the atoms.

Samples may be from the skin surface like the arms, hands or neck. A wipe packet is torn open without touching the wire and given to the worker being evaluated. Employee is to remove the wipe from the package and unfold it. In the case of the hand, a person wipes the palms first and both sides of hand. This wiping is done for not less than 30 seconds using both sides of wire.

For samples not from the skin, gloved hands are used to open wipe packet and unfold the wire.

The designated surface for sampling is wiped through repeated horizontal motions. The second wire is done at right angles to the first wire.

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It was noted that the employees did not wear separate work clothing or boots while at work. There is a common neglect of washing hands before drinking, eating or smoking. Some employees smoked near lead dust and fumes. Most of the times, dry sweeping was done. The respirators worn at work were ill fitting, and worn out.

The Californian lead exposure for workers in workplaces shows only 2.7% of facilities have participated in lead environment monitoring, laboratory based surveillance for lead poisoning in employees may mislead on the number of employees exposed. The Californian facilities that use lead are about 53,000. Around 240,000 employees in these factories are in lead related plant processes. This is only about 2.5% of the total Californian work force.

Only 1. 4% of lead- using process facilities and 2. 6% facilities have the lead monitoring program. Employees in storage battery manufacture potentially exposed to lead are 1, 950. Exposed individuals in the ship building repair, industry are 1, 099 welding repair 312 people. Significantly 107, 322 employees are exposed below lead action level. However, 88, 262 are exposed above action level/

Table showing lead exposure levels in air sampling data:

The control measures recommended are to avoid spillage of lead-based oils and gasoline fumes be stored with facilities that have adequate ventilation systems. Lead process plants be enclosed and employees have sufficient respirator systems. Protective systems like using wet sweeping should be done and exposure to naked eye welding avoided. Consistent supervision, while encouraging minimum exposure to lead and prohibiting of eating, drinking, smoking or cosmetic application in the working place should be some of the control measures.

Administrative controls may target the schedule of working. Risk-prone, lead exposure e processes may be done when there are fewer workers at the facility. Also to protect the unborn, pregnant women may be assigned other work stages away from this (lead) contaminant.

CONCLUSION

The lead poisoning exposure levels are quite high given that about the employees exposed the results postulated show a figure that is not as accurate since less than half the facilities were sampled. Lead, a heavy

metal is absorbed into the digestive system whenever inhaled. Smaller particles of lead reach deeper in the lungs into the broad system. Lead damages body ability to make red blood cells. Lead poisoning for the unborn and children can affect the child's ability to use vitamin D and calcium. It can retard the kid's brain, nervous system and red bone marrow.

Individuals having lead exposure levels that are active levels require chelate treatment.

Lead exposed men have been noted to have problems like low fertility, erectile dysfunction and brain defects. Among women, incidences of still births, miscarriages and social skill problems in the offsprings are rampant.

Substitution of lead for safer elements and change of process to minimize lead exposure for employees at the facility is necessary. Ventilation systems should be installed to reduce the amount of lead in air or dust. Isolation can be done by reducing the number of people present during lead processing. Good hygiene should be enforced. Most importantly, protective clothing, detection gadgets should be applied.

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