

men with an average service of eight years. It requires about two hours to fill a tower with about 10,000 pounds of crude sulphur. Two towers are charged every week. Consequently, the men are exposed about four hours a week to the sulphur dust caused by breaking up the lumps (4,304,640 particles, ten microns or less, per cubic foot) and shoveling the crude sulphur into the tower elevator (an average of 3,357,640 particles per cubic foot). The amount of dust produced by this operation is somewhat reduced by the steam turned on inside the elevator shaft to prevent dust explosions. About 60% of the dust particles in samples taken while the tower was being filled were slightly angular crystalline in appearance under the Konimeter microscope and five microns or less in size; 35% were rounded semi-opaque, ten microns or over in size; and .5% were opaque scale like, between five and twelve microns in size.

Sulphur dust particles are explosive but otherwise are not considered hazardous any more than any of the other "nuisance" dusts, although they will irritate the mucous membranes and the eyes after slight exposure. Consequently, it is advisable to wear rubber type goggles and approved respirators, such as the MSA Camfo type.

In an article by Aldo Cestari (Arch. Intern. Pharmacodynamie, 1933, vol. 46, pp. 300-314) it is stated:

"Intratracheal injection of sulfur suspensions brings about excretion of hydrogen sulfide in a period of 50 hours. There are slight exudative and infiltrative reactions in the lungs. It is supposed that a substance similar to glutathione reduces the sulfur to hydrogen sulfide."

F - LITHARGE: Litharge is added to the Plumbite or "Doctor" Solution to assist in the removal of mercaptans, other sulphur compounds and unsaturated hydrocarbons from gasoline and naphtha. From one to five 600-pound drums of litharge are used in a batch, depending upon the stock to be treated and the condition of the "Doctor Solution". The litharge is removed from the drum a shovel at a time, and about fifteen minutes are required to dump one batch. A batch is made once a week on an average. The average service of the men involved in this operation is seven years. They wear MSA Camfo respirators with an approved lead filter and rubber type goggles. All of the work of adding litharge is done in the open air on a platform at the tops of the solution tanks.

The average dust produced during the dumping or shoveling of litharge into the solution tank is 3,077,480 particles, ten microns or less in size, per cubic foot, although there were as high as 9,288,960 particles per cubic foot during the operation. A rough estimation of this litharge concentration indicates the presence of from five to fifteen milligrams of lead per ten cubic meters - the amount that an average person doing moderate work would breathe in one day. This is in excess of 1.5 milligrams in ten cubic meters which is the maximum allowable limit set by the United States Public Health Service. About 80% of these dust particles were rounded, transparent, crystalline in appearance under the Konimeter microscope, and five microns or less in size; about 15% were over ten microns and appeared to contain small air bubbles; 5% were dark opaque scale-like, from five to ten microns in size.

Necessary Precautionary Measures When Handling Litharge. Litharge is a compound of lead, and consequently there is the possibility of lead poisoning unless a few simple precautions are observed to prevent the entrance of lead into the body by swallowing minute particles of the litharge dust, by inhaling the dust, or by absorption from the skin when handling the litharge. An effort should be made to cause as little dust as possible. Instructions issued by the Medical Department require that: