

December 13, 1937

Dr. Don D. Irish
Dow Chemical Company
Midland, Michigan

Dear Doctor Irish:-

After some delay which was occasioned by the necessity of my being in South Carolina much of last week, I am sending you the information which I promised with reference to the handling of tetraethyl lead.

The solution of bromine in carbon tetra-chloride which I advised as a means of decomposing tetraethyl lead into inorganic lead may be either dilute or concentrated dependent upon the use to which it is to be put. We use a ten percent solution and a five percent solution around the laboratory, and either of these can be kept within a stoppered bottle without the development of sufficient vapor pressure to cause leakage of bromine to any appreciable extent. A more dilute solution can be used since it is merely necessary to have a little excess of bromine over the theoretical requirements for the conversion of lead tetraethyl to lead bromide. Within the limits of quantities of lead which are to be dealt with, the more dilute the solution the better from the point of view of safety as to the volatilization of the bromine, and also as to injury from contact with it. I should say that in your case a five per cent solution should be adequate. As implied above, this can not be kept in an open container without giving off bromine fumes, but it should be kept in a stoppered bottle such as, for example, an acid bottle.

As to the leather gloves, I am enclosing a notation as to where they can be obtained and how they should be prepared. I think you will have to impregnate the gloves with the treating solution in the laboratory since, so far as I know, they can not be purchased already prepared.

I have gone over the regulations and the blue print which were given to me on the day of my visit, and I have made certain notations on the copy and certain other additional notations, all of which I think will be self-explanatory.

KE 0009977

Dr. Don D. Irish

There is only one other further thing which might be said advantageously and that concerns the hood which is in use in the Semi-Plant. I think your hood will be satisfactory for your present purposes, although this ventilation is not quite as great as that which we ordinarily recommend for the handling of Fluid. If the work with tetraethyl lead assumes larger scope, I do not believe that this hood would be adequate. Therefore what you do with regard to this item should depend, in my opinion, on whether this procedure continues or grows. It scarcely seems justified to spend any considerable sum of money in the enlargement or improvement of your hood if this project is likely to be discontinued soon.

It was a pleasure to see and talk with you and I am very grateful for the information which you gave me with relation to your studies on phenol. I was also very much interested in your set-up and your plans in general and I hope to have an opportunity to return at a later date. If I can be of any service to you in connection with any questions which may arise in the handling of tetraethyl lead, please do not hesitate to call on me.

No doubt you have received the sample containers which I sent you and the instructions for the collection of samples. I shall report our findings to you as soon as we have a chance to examine the samples.

With kindest personal regards, I am

Cordially yours,

RAK:ls

Robert A. Kehoe, M.D.

KE 0009978

Leather Gloves for Use in Handling Machinery or
Tools or Other Work for Which Rubber Gloves Are Too
Fragile.

Horsehide gloves of proper type can be obtained from Lipschitz, 400 Chestnut Street, Philadelphia, or from Condor Glove Company, Condor, New York. There are probably other sources from which equally serviceable gloves can be obtained. Cost is approximately \$4.75 per dozen.

These gloves should be treated by being dipped in an impregnating solution and drained. Prepare solution by heating to boiling 1 pound of chipped soap and 4 pounds of glycerine; cool to 130°C before dipping gloves and maintain at not less than 100°C during period gloves are in the solution.

KE 0009979

Regulations Concerning Use of Tetraethyl Lead in the
Semi-Plant

I. Ok except that the wooden box should be elevated on a shelf or bracket so as not to sit in contact with the pan which constitutes the floor of the hood.

II. Paragraph one Ok.

Paragraph two modify as follows:

A convenient container shall be so mounted in the hood as to make available a stream of kerosene through a faucet for washing the equipment and the metal pan of the hood. A quantity of 5% bromine- CCl_4 shall also be available in a glass stoppered bottle for use in the decomposition of any T.E.Pb which may be on glass equipment or which might be spilled outside the hood. This solution should not be applied upon the iron pan or the rubber gloves, but these can be cleaned with kerosene. A source of running water should be supplied within the hood to wash away any kerosene as well as any bromine- CCl_4 which remains on equipment or within the metal pan. The metal pan constituting the floor and the lower portion of the sides of the hood should be so arranged as to drain easily and completely to the drain, and this pan should be kept free of waste materials of all kinds between operations within the hood.

All glass ware with which T.E.Pb comes in contact shall be washed immediately after use with bromine- CCl_4 solution to destroy the T.E.Pb. Also any T.E.Pb which may be spilled on floor or elsewhere outside the hood should be decomposed with bromine- CCl_4 before washing down the drain. T.E.Pb coming in contact with iron or rubber equipment or with the skin shall be washed away immediately and thoroughly with kerosene, followed by soap and water.

III. Paragraph A - Ok.

Paragraph B - Handling in Semi-Plant. Insert the following paragraph after "the following procedure;" Fill the iron catalyst container with the desired quantity of T.E.Pb some time before it is required and inspect carefully after each filling to make sure that no leak is occurring through the valves and that no dripping has occurred on the outside surface of the container. If repairs are required the entire container and valves must be washed carefully and repeatedly with kerosene before dismantling. Otherwise the apparatus should be burned before discarding.

B - Paragraph 2 - Ok as written

KE 0009980

B - Paragraph 3 - Ok.

Paragraph 4 - Following the sentence ending "by the reflux" add the following sentence:

Return gloves to a receptacle in which they should be kept at all times when not in use. Keep gloves clean and discard when worn or when contaminated with T.E.Pb.

Paragraph 5 - Ok.

I should advise the following procedure which need not be recorded in the instructions. I suggest that the regulation for handling T.E.Pb at hood and about the autoclave shall be framed and posted at the hood or in some other conspicuous place within the Semi-Plant. I suggest this both as a reminder to the men and as evidence that the men have been properly instructed. Needless to say this suggestion is a matter for the discretion of your own management since it involves the policy of your company.