

SUBJECT PURIFICATION OF HYDROGEN by
Removing Oxygen & Moisture

SUPERSEDED DATE 2/28/42

The process outlined below consists simply of passing the gas thru a tube heated to but not over 500°C containing nickel or copper chips or wire, thru a cooling coil and thru a "Lectrodryer". Oxygen in the gas is converted into moisture thru the catalytic action of the chips and this moisture plus that originally present is adsorbed by the activated alumina in the "Lectrodryer".

This process is used for the treatment of hydrogen before use in filament flashing and forming bottles, in firing of certain parts and in preparation of tungsten and "Downmo" wire.

To determine efficiency of process refer to 34-37-9A.

A. EQUIPMENT

1. Hoskins FD-303 tubular electric furnace with 1 1/2" I.D. x 12" length heating tube or equivalent.
2. Purifying Tube - For above furnace - 3/4" size iron pipe, 24" long, firmly packed with copper or nickel shavings or wire clippings. Tube extends thru the heating furnace, maintained in a vertical position, the flow of hydrogen being in a downward direction. Since shavings and clippings have a tendency to pack, on heating, vertical position of furnace will insure gas passing thru shavings and clippings instead of over them if furnace is in a horizontal position. Passing gas downward thru purifying tube will also insure more efficient flushing since hydrogen is lighter than air and thus air will settle in tube near outlet. On subsequent installations, it is preferable to use a nichrome purifying pipe since iron pipe at temperatures around 500°C (dull red heat) allows the passage of oxygen into the system.
3. Cooling Coil - 10 turns 1/4" copper tubing, coil I.D. - 8".
4. 2 Laboratory "Lectrodryers".
5. Rubber tubing.
6. Thermometer °C.

B. MAINTENANCE

- ** 1. Purifying tube will last indefinitely **if made of nichrome and will require no attention as long as it remains gas tight.
- 2. Lectrodryer should be replaced by reactivated one after about 50 hrs. of service at the rate of 30 cu. ft./hr., or more frequently if needed.
3. Reactivation of Laboratory Lectrodryer - Pass air at a flow rate of 85-100 cu. ft./hr. downward thru dryer and attach heating element within dryer to 110 volt line (AC or DC). Insert standard laboratory thermometer in well at top of dryer. Well temperature should never exceed 121°C at any time during reactivating cycle. Increase air flow if temperature rises above 121°C. When temperature in well reaches 70° -80°C, test exit air every 1/2 hr.

(Cont'd on Page 2)

*Indicates correction.

★ INDICATES A CHANGE

✱ INDICATES AN ADDITION

1/9/41 34-34-4B 2

PRK 3/8

Harrison