

there were 3.74 cc of D<sub>2</sub>O and 21.76 cc of H<sub>2</sub>O. Hence the separation factor,  $\alpha$ , is given by:

$$\alpha = \log \frac{33.81}{21.76} / \log \frac{4.15}{3.74} = 4.26$$

This value is about the same as that achieved in electrolytic separation, but it should be possible to increase it further when the optimum conditions for the process are known.

These investigations indicate that a palladium membrane can be used for months, or even years, in the separation of hydrogen isotopes by electrolytic migration without any appreciable deterioration or poisoning. A cascade process utilising these membranes has yet to be tested experimentally, but if successful it may well provide a basis for a more efficient separation of hydrogen isotopes than has hitherto been possible.

## Fume Elimination in Enamelling Ovens

Processes for the catalytic combustion of fumes from enamelling ovens have been successfully developed during the past three or four years, and are in active use in several types of manufacturing operations. The advantages of this method of dealing with oven effluents and preventing condensation in wire enamelling ovens were described by Mr. R. J. Ruff, President of the Catalytic Combustion Corporation, Detroit, in a paper given before the Wire and Cable Section of the National Electrical Manufacturers Association at its annual convention in Atlantic City. The paper, published in *Wire and Wire Products* (1957, 32, (1), Jan., 62-64), reviews first the conventional methods of fume elimination by dispersion, water scrubbing and direct flame incineration, and then deals more particularly with the use of a platinum catalyst to achieve oxidation and burning.

The catalyst unit resembles an air filter element in appearance, and consists of thin ribbons of nickel alloy on which platinum has been deposited. The ribbons are crimped into the form of a mat, and conditioned for activity. A typical mounting arrangement for a catalytic combustion system is shown in the diagram. The basic difference between the latter process and direct flame incineration is that the catalyst accelerates fume combustion, permitting the oxidation reaction to proceed at about 500° F. As the fume burning

temperature now approaches the oven exhaust temperature, little pre-heating is required and this frequently during starting operations only.

More than 500 wire enamelling ovens are now equipped with this system, and many are exceeding 15,000 hours of operation without the need for servicing. Other oven operations in the electrical manufacturing industry where the catalytic combustion system have been successfully employed include coil-baking, core-plate enamelling and fabric and paper impregnation.

