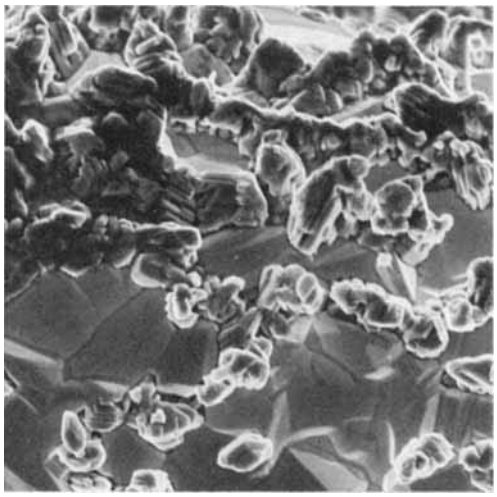

Fig. 26 Rear of gauze 3 used in a medium pressure plant, secondary electron image ×2000

Rinsing in hydrochloric acid will not change the behaviour of this type of surface since rhodium oxide is insoluble even in the boiling acid. The oxide can, however, be reduced with hydrogen or dissociated under nitrogen as suggested by Harbord (11). After these treatments a diffusion anneal should be used to redistribute the rhodium in the gauze alloy. Harbord also mentions that rhodium oxide formation is unavoidable in high pressure plants because of the high oxygen partial pressure. This will only be true where a compromise, between the temperature required to prevent rhodium oxide formation and that necessary to restrict direct metal losses to a tolerable amount, has to be made. Connor (4) states that metal losses increase by a factor of ten if the operating temperature is increased from 820 to 920°C. The effect of such a compromise is shown in the final set of scanning electron micrographs in Figures 21 to 26. These pictures are of gauzes from a medium pressure plant using five gauzes. Nothing unusual was noticed on gauzes No. four and No. five, where thermal etching only was observed, and on the inlet face of the first gauze the usual complex growths are seen (Figure 21). On the back of the first gauze, and on both sides of gauzes Nos. two and three, areas of crystalline rhodium oxide are seen between the metal grain structures. The rhodium oxide appears to reach its maximum development on the back of the second gauze. Provided these areas do not increase in size, the performance of the catalyst will be only slightly affected.

This short account shows how useful the scanning electron microscope is for examinations of catalyst gauzes with good or bad performance. As well as providing spectacular pictures it is possible that the study of the surface structures may come to be a more reliable guide to optimum process operation than the more usual measurements of temperature, pressure and gas compositions.

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Catalytic Purification of Industrial Waste Gases

Too many manufacturing processes still result in the discharge to the atmosphere of noxious gases even though the technology for removing the offending contaminants frequently exists or can readily be developed.

A short communication by T. G. Alanova, A. A. Myagkova and V. N. Kulikova (*Khim. Prom-st.*, 1975, (3), 233), describes work which has been successfully carried out to purify the waste gases resulting from a fermentation process during the manufacture of streptomycin. A comparison of catalytic and high temperature methods showed the superiority of the catalytic process and favoured a platinum on Nichrome catalyst.