

heating at this point to prevent discolorisation and condensation of the product. The shorter heating period may therefore account for the greater purity of this "crude" azelaic acid compared with samples obtained after longer heating periods. Two comparative g.l.c. traces for the esterified products from our work and the currently available acid derived from the ozonolysis of castor oil showed a single product in our case, whereas the commercial product contained 8 per cent of impurities. We therefore have an excellent, potentially commercial route to azelaic acid from 1,5-cyclooctadiene, the three stages of which proceed in almost theoretical organic yield to give a pure "crude" product.

Most of the practical work was performed by Mr. R. Jackson and I would like to express my thanks to him, and to Dr. D. E. H. Jones for discussions on aluminium chemistry.

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Selective Rhodium Plating for Electrical Contacts

The use of rhodium for light duty contact purposes is well established, as are the techniques for restricting this expensive metal to those areas required for contact only. The problems of cracking, microcracking and exfoliation have been well documented and these factors are covered extensively in a paper presented by Afsar A. Khan of G.T.E. Automatic Electric Laboratories Inc., North Lake, Illinois to the meeting of the American Electroplaters' Society in New York during March 1975.

The paper discusses controlled depth selective electrodeposition of rhodium on iron-base alloys for dry reed contact applications. Selective plating of reed blades is a necessary design requirement rather than a cost reduction approach since rhodium deposits, while needed on the contact area, are detrimental to glass-to-metal sealing. Nominal plating thickness should be held to within ± 13 per cent. The plating area is mainly controlled by maintaining a smooth laminar flow of the recirculating plating solution in the tank through a series of baffles and also by maintaining a uniform depth of immersion of the contact reeds to ± 0.010 in. Temperature is 40 to 50°C to minimise solution evaporation and to provide even plating thickness on the rack.

In this case the substrate is unusual in that the iron-base alloy for reed switches is easily attacked by the rhodium sulphate electrolyte.

All rhodium plating solutions yield highly stressed deposits but as phosphate solutions are prone to higher levels of stress and cracking than sulphate solutions, the latter are the natural choice for plating crack-free rhodium in thicknesses up to 200 μ m. To minimise the problem of attack by these solutions the author states that a gold undercoat is used to protect the iron-base alloy but he does not specify the thickness of this undercoat.

Experience elsewhere has shown that a low stress gold deposit beneath rhodium can give rise to marked changes in the stress cracking of the rhodium deposit. Unless the quality of the undercoat is very carefully controlled this can have a significance greater than the methods outlined in this paper. The recommended careful attention to cleanliness, frequent carbon treatment together with the attendant filtration, and careful exclusion of organic contamination are all, of course, useful contributions to good rhodium plating practice.

The sections devoted to the correction of faults in deposits are interesting, particularly those parts concerned with defects associated with the evolution of hydrogen at the work face. No explanation is attempted for why a momentary "dwell" in the electrolyte before plating commences leads to elimination of this problem.

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