December 1969

Brief 69-10689

NASA TECH BRIEF

Reducing Contact Resistance at Semiconductor to Metal or Aluminum to Metal Interfaces

The problem:

Semiconductor device processing usually requires metallic contact to the device surface. In preparing for metal deposition, an insulating dioxide grows on the exposed wafer surface. Reducing the contact resistance requires high-temperature heat treatment to diffuse metal through the oxide. A similar problem occurs when contacting layers of aluminum.

The solution:

Etchant containing chloroplatinous or chloroplatinic acid greatly reduces contact resistance between metallic surfaces. This idea may interest semiconductor processors.

How it's done:

When preparing silicon for metallic contact, add chloroplatinous or chloroplatinic acid to a buffered etchant. Etching results in a monolayer plating of platinum on the wafer surface, preventing oxide growth. Deposited metal contacts the low resistance platinum to silicon interface.

Similar plating occurs on aluminum surfaces by adding chloroplatinous acid to either a buffered etchant or acetic acid plus buffered etchant. Adding chloroplatinous acid reduces contact resistance by a factor of a 100 or more.

Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
Electronics Research Center
575 Technology Square
Cambridge, Massachusetts 02139
Reference: B69-10689

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: K. R. Keller of
RCA Corporation
under contract to
Electronics Research Center
(ERC-10254)

Category 01