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The Effect of Nitrogen-containing Chromium Diamond-like Carbon Coating by AEGD hybrid-CVD coating Process

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Miniaturization of electrode materials is a field receiving high interest for the development of electric automobiles and hybrid automobiles. In particular, technologies that improve the electric conductivity of stainless steel, while maintaining corrosion resistance, are given high technological interest to maintain electric conductivity and to improve corrosion resistance. In particular, metal doping studies for Ti, Cr, Si and W are currently in progress to enhance the characteristics of conductivity and corrosion resistance with excellent properties such as corrosion resistance and lubrication of DLC coating.

However, in the case of PECVD, when forming a coating layer using metal and reaction gas, a very limited precursor is used so there are many limitations in coating features.

Furthermore, conductivity cannot be improved considerably by only using metals such as Cr. However, it was observed that by adding a small amount of nitrogen using the high energy ionization features of AEGD (arc-enhanced glow discharge), there was a stark drop in electric resistance.

This shows a very practical aspect compared to the addition of other elements and there is a clear change in properties by adding a small amount of nitrogen gas, so this study aims at reporting the research results.

Keywords

Nitrogen doping

Cr(N)-C:H film

graphitic carbon

plasma CVD

arc enhanced glow discharge (AEGD)