Metal Electroplating on Diamond Substrate

The invention provides a method to electroplate substrates with metal, no matter how rough the substrate. Electroplating onto a rough substrate is complicated by the tendency of electro-deposition to occur only at the peaks of the rough surface. This is because, on a rough surface, the electric fields are far stronger at the peaks than in the valleys, and all the charge accumulates there. This is the same phenomenon that is at work with lightning rods. To counter this, the rate of oxidation is adjusted so that there is no excess charge. Electroplating then occurs inside the valleys, smoothing the surface.

ADVANTAGES

1. Materials that previously could only be metalized by inefficient physical vapor deposition methods can now be electroplated.
2. Provides full control over final roughness of surface.
3. Adhesion is unaffected by surface morphology.
4. Simple implementation.
5. Inexpensive equipment requirements.

INVENTION STATUS

This technology is covered by Patent 5,873,992. The technology is available for licensing.

For more information: Mark Swaney
mailto:mswaney@uark.edu or 479-575-7243
http://www.uark.edu/ua/techip
Ref.: 95-07
04/14/08