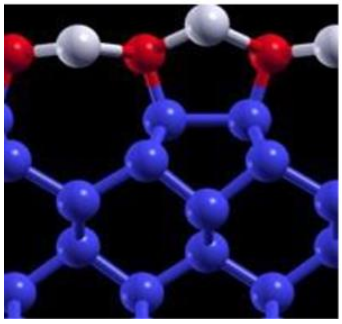
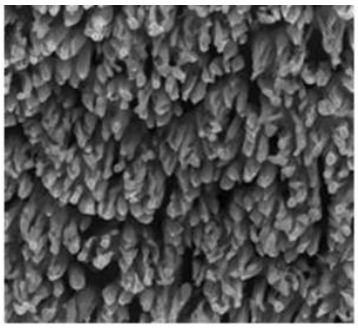
Collaboration/Licensing Opportunity

University of BRISTOL
Research and Enterprise Development

Low Work Function Diamond Surface

A method for producing a low work function surface on any material electrode that incorporates diamond





Thermionic energy conversion devices which convert heat energy into useful electrical energy are generally inefficient and only operate at high temperatures. A typical thermionic emission device consists of a cathode emitter spaced apart from an anode collector. The cathode emitter emits electrons when heated, which are collected by the anode, thereby giving an electrical current.

The efficiency of a thermionic device can be improved by changing the structure of the cathode emitter. In doing this it is desirable to produce a surface with a lower work function and which can also operate at lower temperatures. The Bristol invention is a simple method of producing such as surface on materials that incorporate diamond or diamond-like particle layers or coatings. The method may be advantageously applied to the fabrication of many types of vacuum device employing electrodes to significantly improve the efficiency with which they produce a source of electrons

Key Benefits

- A multitude of tasks can be conducted to a higher level of precision through the improved stability
- High temperature and chemical stability
- Low work function surfaces
- Low operating temperatures (<500°C)

Applications

- Thermionic solar energy converters
- Photomultiplier tubes
- Scanning electron microscope emitters
- High power thermionic valves and microwave amplifiers
- Ion-gated FETS
- Low power portable X-ray sources
- Fuel cell (nuclear battery)

IP Status

US Patent application: US20120244281

For more information contact:

Rosalind Darby

Research Commercialisation Manager
Tel: +44 (0)117 954 6992,
rosalind.darby@bristol.ac.uk

Ref 1656