

PATENT ASSIGNMENT

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LICENSE TO THE UNITED STATES GOVERNMENT

WHEREAS, Roy Gordon, Seigi Suh and Jill Becker, of, Cambridge, MA, Pleasanton, CA, and Cambridge, MA respectively, have invented "Highly Conformal Tungsten Nitride Thin Films" and a patent application has been filed thereon in the United States bearing U.S. Serial No. 10/520,456 and a filing date of January 7, 2005 and

WHEREAS, the invention was made in the course of research supported by the National Science Foundation under N.S.F. Grant 9975504; and

WHEREAS, the United States Government is entitled to certain rights in and to said invention and any U.S. application by reason of the terms relating to such support; and

WHEREAS, the President and Fellows of Harvard College, hereinafter called the "Licensor" has acquired by assignment from the inventors the entire right, title and interest of the inventors to such invention;

NOW, THEREFORE:

1. The Licensor, in consideration of the premises and other good and valuable consideration, hereby grants and conveys to the United States Government a non-exclusive, non-transferable, paid-up license to make, use and sell the invention throughout the world by or on behalf of the Government of the United States and states and domestic municipal governments under the aforesaid patent application and any and all divisions or continuations, and in any and all patents or reissues which may be granted thereon during the full term or terms thereof.

2. The Licensor covenants and warrants that he has the right to grant the foregoing license, and that any assignment or license which he may make of the invention or the said patent application or patents thereon, shall expressly be made subject to this license.

3. The Licensor agrees that the Government shall not be estopped at any time to contest the enforceability, validity, scope of or title to any patent or patent application herein licensed.

4. This License shall not limit the rights reserved to the Government under the contract(s), grant(s), or other arrangement(s) under which said invention was made.

Signed this 2nd day of March, 2006

PRESIDENT AND FELLOWS OF HARVARD COLLEGE

Carol C. Quilty
Carol C. Quilty
Patent Coordinator
Office of Technology Development

VAPOR DEPOSITION OF TUNGSTEN NITRIDE

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Related Applications

This application is related to copending application PCT/US01/30507, filed September 28, 2001 and entitled "Vapor Deposition of Metal Silicates and Phosphates".

10 This application is related to copending application serial no. 60/253,917, filed November 29, 2001, entitled "Vapor Deposition of Metal Oxides, Silicates and Phosphates, and Silicon Dioxide."

Statement as to Federally Sponsored Research

This invention was made with the support of the United States government under
15 National Science Foundation Grant No. ECS-9975504. The United States may have certain rights in the invention.

Background of the Invention

1. Field of the Invention

This invention relates to materials and processes for deposition of tungsten-containing
20 thin films on solid substrates. This invention also relates to methods and materials for making electrically conducting, conformally deposited films for fabrication of devices in the areas of microelectronics.

2. Description of the Related Art

Tungsten nitride, WN_x , is considered to be a good barrier against diffusion of copper
25 in microelectronic circuits. WN_x can also be used in electrodes for thin-film capacitors and field-effect transistors. WN_x has been made by reactive sputtering, but the uniformity of film