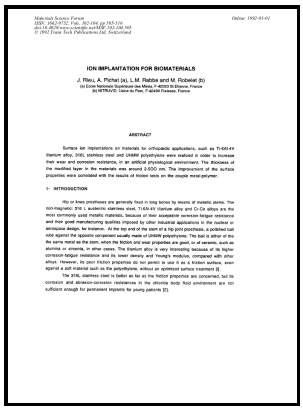
Improvement in wear resistance of ion implanted materials.

Brighton Polytechnic, Department of Applied Physics - Wear resistance of ion



ION IMPLANTATION FOR BIOMATERIALS

ABSTRACT

Description: -
-improvement in wear resistance of ion implanted materials.
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Notes: [Dissertation submitted for] M.Sc. degree in applied solid state physics.
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Tags: #Improvement #in #wear #resistance #of #C+ #ion #implanted #DC #magnetron #sputtered #TiC #film

Improvement in wear resistance of C+ ion implanted DC magnetron sputtered TiC film

In this process a beam of impurity ions is accelerated to kinetic energies in the range of several tens of kV and is directed to the surface of the silicon.

Ion Implantation

Processing technology for reducing chemical wear of diamond tools.

Ion Implantation

Even at a cutting distance of 3000 mm, the surface roughness can still be maintained at 1—2 nm. Evidence for the effectiveness of these bearings is very limited, given the short length of follow-up, the lack of comparative data for other bearing surfaces in the same design, and patient selection for example, one study was limited to only rheumatoid arthritis patients. This study explored the effects of nitrogen N ion implantation of drills for wood-based materials.

Improvement of metal properties by ion implantation

Journal of Materials Research 7, 1900—1911 1992.

Material Used in Orthopedic Implants

Experimental results demonstrate that cold plasma can improve the hydrophilicity of the cutting tool as well as reduce the adhesion of the workpiece material to the cutting tool. The presence of air pressure and oxide layers help reduce direct contact between the tool and the workpiece, which in turn, reduces the chemical wear of the diamond tool. Werner Z, Pochrybniak C, Barlak M, Gosk J, Szczytko J, Twardowski A, Siwek A 2013 Magnetic properties of manganese implanted silicon after pulse plasma annealing.

Improvement of Wear Resistance in Cemented Tungsten Carbide by Ion Implantation

Graphite wear mechanism of diamond tools and typical anti-wear process. Figure illustrates the diffusion mechanism of carbon atoms in diamond-cutting ferrous metals. Transformation of diamond structure to more stable graphite structure.

Life

The energy of the ions, as well as the ion species and the composition of the target, determine the depth of penetration of the ions in the solid: A monoenergetic ion beam will generally have a broad depth distribution. Raebel S, Worzala F, Conrad J 1990 PSII nitrogen implanted M2 tool steel for wear resistance in wood machining tools. These metals had been certified to be extremely biocompatible.

Improved hardness and wear properties of B

Adhesion, interface strain, internal stresses, film layer ductility, strength, etc.

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