Institut "Jožef Stefan", Ljubljana, Slovenija

center za prenos tehnologij in inovacij
na Institutu "Jožef Stefan"

Licensing opportunity

New era of lubricants decreasing friction coefficient for 60 % and wear coefficient for more than 90 %.

Field of use
Lubricants, MoS2 nanotubes, friction and wear properties of materials.

Current state of technology
The technology has been demonstrated and tested in laboratory. Technology is ready to be licensed out.

Patent status
Patent granted in USA and EU countries: Germany, France, United Kingdom, Italy.

Publication
TBA

Developed by
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Reference
TBA

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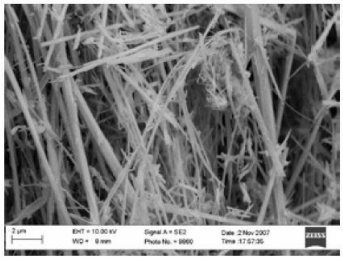

Background

Inorganic solid lubricant molybdenum disulfide (MoS2) is known lubricant, which has been applied extensively for decades. The easy mutual gliding of MoS2 layers along (100) basal planes, and surface inertness of MoS2 give it its low friction properties.
The MoS2 in usual plate-like form is widely used as a dry lubricant or an oil or grease additive. Unfortunately, the high-hardness edges of crystal layers are prone to oxidation, which reduces the efficiency of lubrication, especially in humid environment. Thin flakes with high active surface and with a relatively low number of unsaturated bonds at edges are therefore preferable.

Description of the Invention

The knowledge of MoS2 platelets as additive for friction reduction and recent discoveries of new morphology of MoS2, in a form of nanotubes, have opened the route of a new lubricants with significant higher anti-friction protection.

Main Advantages

- Spontaneous partial exfoliation of the nanotubes, which enables effective covering of the contact surfaces.
- This surface coating reduces friction.
- Surface acts anticorrosive due to temperature reduction at the interface.
- Friction reduction is much larger in comparison with the standard MoS2 platelets.
- The MoS2 nanotubes can replace toxic extreme pressure additives in oils and greases.
- The MoS2 nanotubes can be easily mixed into polymers for use as self-lubricative coatings.