

Scientists develop new lube from graphene and polythene

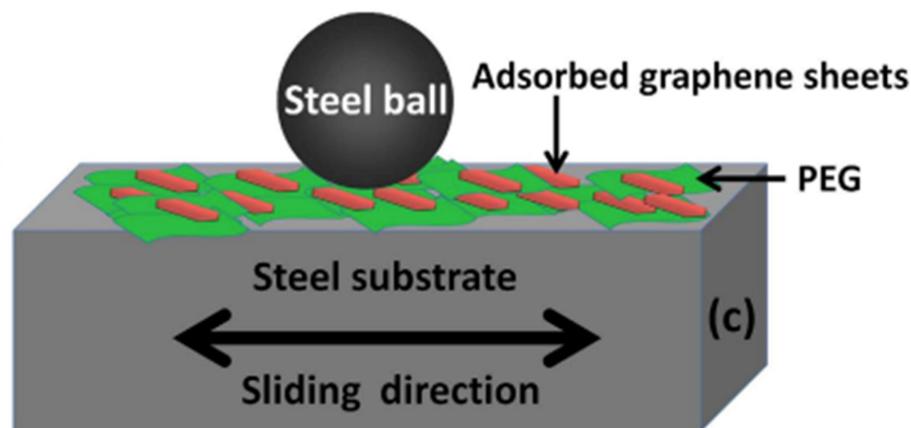
By Bhavya Khullar

New Delhi, April 20 (India Science Wire): Lubricants are used in industrial machines to minimize friction and prevent wear and tear. Researchers have developed a new lubricant that minimizes friction in sliding steel interfaces, making it promising for applications ranging from robotics to metallic knee joints.

The lubricant is made using a polythene compound called polyethylene glycol 600 and graphene which is one million times thinner than a human hair. Glycol is inserted between layers of reduced graphene oxide sheets which have special chemical properties. The resulting product has a high lubrication capacity.

When tested for its ability to reduce friction between layers of sliding steel, the new lubricant showed record low values of friction. It reduces friction by increasing the chemical stability and mechanical strength of reduced graphene oxide sheet.

The new lube has been developed by researchers at the Indira Gandhi Centre for Atomic Research in Kalpakkam, Tamil Nadu. This group collaborated with researchers from the Swiss Institute for Dryland Environmental and Energy Research, Jacob Blaustein Institutes for Desert Research, and Ben-Gurion University of the Negev in Israel, and the University of Tokyo in Japan.



Picture: The new lubricant made using graphene sheets (green) and polyethylene glycol (orange) reduces the friction between steel surfaces.

“Our work will certainly help to synthesize effective lubricant additives. We have shown a record low value of friction in graphene oxide blended lubricant sliding against steel-steel interfaces”, says Professor Niranjana Kumar at the Indira Gandhi Centre for Atomic Research in Kalpakkam.

Scientists suggest another possible use of this new lubricant. The additive polyethylene glycol is already widely used in biomedical applications for

reducing friction and wear of knee joints. They say that the new lubricant can be a better material for this purpose. However, this needs to be thoroughly investigated for safety.

“This lubricant is easy to prepare and is a potential material for energy-efficient tribological applications in machine element”, researcher said. The group included Bhavana Gupta, Niranjan Kumar, Kalpataru Panda, Vigneshwaran Kanan, Shailesh Joshi, and Iris Visoly-Fisher. The findings are published in a recent issue of the journal Scientific Reports. (India Science Wire)