



NEW PLATINUM ALLOY COULD BE THE MOST DURABLE METAL ON EARTH

A new alloy made of 90% platinum and 10% gold is being described as the most durable metal on earth, but could it really make a contribution in the real world?

Alloys are hybrid materials created when two elements are combined. Although platinum/gold combinations have been in use for centuries, engineers at Sandia National Laboratories in the US have developed a new way of mixing the metals to create an alloy that they say is 100 times more wear-resistant than high-strength steel.

Should this be the case, the new alloy would be the world's first metal to rank alongside diamonds as one of the world's most wear-resistant substances.

The potential practical impact of an ultra-low-wear alloy could be significant, most notably in electrical contacts.

500 times around the world without wear?

Metals used in electronics are prone to corrosion and wear. As a result, they require protective barriers (thin films) and these are often made of precious metals. This addition, however, often adds significant cost to the manufacturing process.

This newly developed alloy, when used as a coating, could eliminate the need for a traditional

protective barrier and, therefore, cut the cost of everyday electronic items, such as TVs and mobile phones. Although the alloy has only been created in the form of extremely thin coatings (1.7 micrometres thick), the team claims that if your car was fitted with tyres made of the material, you could drive around the earth's equator 500 times before your tyre would show signs of wear.

As exciting as the above metaphor might be, it does warrant a caveat, however. Ian Hutchings, Professor of Manufacturing Engineering at Cambridge University, explains: "The wear has been tested under very specific conditions – sliding backwards and forwards on a sapphire ball at a slow speed to produce 'fatigue wear'.

"Under these conditions it does show very low wear, but that result would not necessarily apply to other mechanisms of wear."

The development process also uncovered a second surprise finding: the Sandia team say that the alloy – when placed under stress – produced a diamond-like carbon of its own i.e. a lubricant. This suggests that manufacturers would not need to introduce an additional lubricant.

DID YOU KNOW?

Platinum is one of the heaviest metals in the world:
A six-inch cube of platinum weighs as much as an average human being

Broadening uses of platinum

It is worth remembering that this alloy remains in prototype and is yet to be tested in the real world, with an associated cost/benefit analysis. Should it, however, become commercialised, it would add to the already broadening range of uses of platinum in the electronics industry, and could add to industrial platinum demand.

Platinum's varied characteristics lend it to a wide variety of applications, particularly in the medical and automotive sectors. In addition to its everyday uses, platinum can function as an investment asset, delivering demonstrable portfolio diversification benefits.

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