METALLURGY

Molybdenum for Jets

➤ THE American metal molybdenum promises to play an important part in high-speed aviation in the near future. Researches at Battelle Memorial Institute, Columbus, Ohio, show that this metal can be used more largely than at present in the construction of jet and rocket engines to operate at the extreme high heat necessary for efficiency.

The attainment of more compact and efficient power plants depends, in part, on the perfection of heat-resisting materials superior to those available today, Robert M. Parke, Battelle's specialist upon refractory metals, points out. Extensive investigations are being conducted, with Office of Naval Research support, with the primary objective of raising the usefulness of molybdenum to a level consistent with its abundance.

Present requirements for heat-resistant metals are being met largely by alloys in which iron, nickel, or cobalt are major constituents, Mr. Parke states. To make any substantial increase in the operating temperature of the metal parts of heat engines, a metal must be selected which has a melting point greater than that of iron, nickel or cobalt. These are 2,800 degrees, 2,700 degrees, and 2,650 degrees Fahrenheit, respectively.

All metals with melting points above 2,800 degrees are either difficult to fabricate or scarce, or both. Molybdenum has a melting point of 4,750 degrees. It is abundant, particularly in the United States. Although not now easy to fabricate, it seems certain that improved methods will be found. This is one of the problems that Battelle Institute hopes to solve.

In addition to its high melting point, molybdenum has other properties which can be expected to contribute to its sucessful use as a heat resistant metal in aviation power plants and other applications. It conducts heat about twice as well as iron and its coefficient of thermal expansion, its rate of expansion when heated, is among the lowest of pure metals. The magnitude of these properties will aid in preventing distortion due to high heat.

One disadvantage of molybdenum is its inability to resist rapid oxidation above 1,400 degrees Fahrenheit in air. Above this temperature it forms an oxide that evaporates as rapidly as it is formed, thus giving no protection to the metal. This constitutes another problem to be solved, but solution is promised.

Science News Letter, November 12, 1949

NUCLEAR PHYSICS

New Platinum Isotope Exceeds First Find

➤ THOUGH you woudn't be able to find it even on careful examination of your ring, a new isotope of platinum has been discovered.

An isotope is a substance or element having the same place in the atomic table as another but with a different atomic weight. Radioactive isotopes being produced by the atomic piles are valuable research tools, in studying cancer for instance, and many new ones have been artificially produced in recent years.

Discovery of rare, stable varieties of elements, such as this isotope of platinum, is rather unusual.

Existence of the platinum isotope of mass 190, has been confirmed by Wallace T. Leland of the physics department of the University of Minnesota. He found, however, a greater abundance than was reported by the original discoverers, Dr. H. E. Duckworth, Robert F. Black and Richard F. Woodcock of Wesleyan University, Ohio.

The new isotope was found by examining in a mass spectrograph vapor obtained by the evaporation of platinum from a heated filament covered with platinum. Its abundance is about one part in 10,000, instead of one part in 16,000 as previously reported.

Science News Letter, November 12, 1949

Words in Science—AC—DC

➤ ELECTRIC current is a flow of electrons. It is a continuous flow which may be all in one direction or back and forth.

When the electrons flow through the wires in one direction around the circuit, the current is called DC, which means "direct current." It is incorrect to speak of DC current, because the C in DC means current.

In AC—alternating current—the electrons move back and forth. But in most applications of electricity, it is not the electrons that are wanted at the far end of the line, but power and energy. There are plenty of electrons there already.

A wire, any metallic conductor, is full of electrons. All that is needed is to set them in motion.

The alternating current transmits a motion of the electrons, not the electrons themselves.

Science News Letter, November 12, 1949