PHYSICS

Hint New Dosimeter

Study of magnetic color centers in common salt and other alkali halides may lead to useful method of measuring radioactive dosage.

➤ A MAGNETIC study of color centers in chemicals such as common salt is being conducted at Oregon State College, Corvallis, by Dr. Allen B. Scott, associate professor of chemistry, under an Office of Naval Research grant.

Color centers are formed when vacant spots in an alkali halide compound which lack a negative charge pick up electrons either when illuminated by X-rays or when heated in sodium vapors, Dr. Scott said. Temperatures up to 1,000 degrees Fahrenheit are necessary for the heat treatment.

The wandering electrons settle down in the vacant places and impart a color to the compound, depending upon the length of exposure to light and heat the alkali halide receives. An alkali halide is a chemical combination of sodium or potassium with either of the four halides—fluorine, bromine, iodine or chlorine.

The colors, which are imparted and make the salt crystals slightly magnetic, include shades of yellow, blue, violet and pink, depending on the particular alkali halide used. Before exposure the salts are colorless.

Magnetic forces on the crystals as small as one billionth of an ounce have been measured, Dr. Scott reported. Equipment developed by the Oregon State College chemistry department is used to measure these infinitesimal forces.

Interest in this research has developed because the colors are also produced by radioactive particles and the intensity of color tells how strongly exposed the crystals have been to harmful radiation. The method may be useful to measure radioactive dosage.

This color formation is closely related to many processes common to photography and television. It was found that these migrating electrons—knocked loose in the crystal by the X-rays—make the crystals photo conducting, Dr. Scott said. They are similar to the silver salts used in photographic plates.

Dr. Scott's work has recently been reported in detail in several scientific journals, including the PHYSICAL REVIEW and the JOURNAL OF CHEMICAL PHYSICS.

Students who have worked on this program are Dr. L. P. Bupp, now at Hanford, Wash., H. J. Hrostowski, now at the University of California; and Dr. K. H. Sweeny, now at Aerojet Engineering Corp., Pasadena. William A. Smith and Floyd Theisen, graduate students, are currently working on the research.

Science News Letter, April 21, 1951

METALLURGY

Brazil's High Grade Ores

➤ BRAZIL, as well as Russia, has large deposits of high-grade iron and manganese ores, the two minerals essential in steel production, the U. S. Geological Survey reported recently. These deposits are important to the United States, particularly the manganese because America now imports about 90% of this ore, without which steel cannot be produced by present known commercial processes.

The Soviet Union is the only other nation known to have an ample domestic supply of both iron and manganese ore. America has enough high-grade iron ore to last another generation or so, and has plenty of the magnetic taconite that can be used in iron production. It has considerable supplies of manganese, but it is of low grade, and this country now imports some 1,500,000 tons of manganese a year.

The report on Brazil's reserves of manganese in the Serra do Navio district was based on field work to determine Brazil's resources in both iron and manganese. The survey extended over the past ten years as a cooperative project of geologists of both countries. The report is available from the U. S. Government Printing Office for 45 cents. It is Geological Survey Bulletin 964-A.

While an accurate appraisal of the overall tonnage of Brazil's resources in these minerals cannot yet be made, it has been determined that the country contains the two largest deposits of high-grade manganese known in the Western Hemisphere. Rich deposits of high-grade iron ore have also been found.

Brazil is already supplying America with some manganese, but the amount is small. Mexico, Cuba and Brazil together supply about 20% of the present manganese used here. India, the Union of South Africa and the African Gold Coast contribute about 70% of the tonnage needed. Prior to World War II, America's great source of manganese was Russia.

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BLACK LEOPARD—This leopard is merely a black variation of the ordinary spotted form, and close inspection would reveal the presence of spots. Known as melanism, the black condition is caused by an overabundance of dark pigment. Jezebel now resides in the recently opened Carnivora House of the Philadelphia Zoo.

BIOLOGY

Wheat Rust Less Dangerous Than Experts Had Feared

➤ NATURE'S BIOLOGICAL warfare in the form of the new invasion of stem rust fungus will not take heavy toll of America's wheat crop this year if early indications are correct.

The race 15B stem rust that caused an epidemic in durum wheat in Minnesota and North Dakota last year has evidently been held in check by drought in the southern regions of the country. Experts feared that the rust would survive the winter there and thus be ready to be blown back north. The new invasion is not prevalent markedly in Mexico which is a potential reservoir of the disease.

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CHEMISTRY

Predict One Drop of Blood For Full Chemical Analysis

➤ SOME TIME in the future one drop of blood will be enough for a complete chemical analysis on which life-saving diagnosis of illness can be made, Dr. Albert E. Sobel of the Jewish Hospital of Brooklyn, N. Y., predicted at the meeting of the American Chemical Society in Boston.

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