

CHEMISTRY

Heavy Neon is Concentrated To Purity of 99 Per Cent.

Achievement Hailed as of Great Importance and Comparable With Discovery of Heavy Hydrogen

PREPARATION of 99 per cent. pure "heavy" neon, the gaseous element most widely known for its use in reddish advertising signs, was announced before the meeting of the British Association for the Advancement of Science in Norwich, by Dr. Gustav Hertz of the Siemens-Halske Company, Berlin.

The achievement is comparable with the concentration of pure heavy hydrogen for which Prof. Harold C. Urey, Columbia University, recently was awarded the Nobel Prize in Chemistry, because of the importance of neon in experiments on atomic structure.

Ordinary neon gas consists of two isotopes, which are chemically indistinguishable but have different atomic weights. The lighter and predominating fraction has an atomic weight of 20 and the heavier one a weight of 22. As found naturally, they occur in the proportion of nine to one, respectively, and give the average atomic weight of 20.2.

Dr. Hertz's concentration of the mass 22 kind of neon makes the second case where an isotope has been separated in usable quantities. Hydrogen's heavy isotope is the other.

Samples of the almost pure heavy neon have already been given to Prof. F. W. Aston, Cambridge University, England's most famous experimental scientist dealing with atomic weights. Another sample is being rushed to Dr. Kenneth Bainbridge of Bartol Research Foundation, Swarthmore, Pa., for analysis on his mass-spectrograph. Prof. Ernest O. Lawrence, University of California, may also receive some of the precious heavy neon for experiments in nuclear physics.

Commenting on the concentrated heavy isotope of neon, Prof. Aston hailed the work as a great aid to experiments on nuclear disintegration, because by using the heavy neon gas, investigators can be sure that its weight is unambiguously 22. Recent work has shown that nuclear studies such as artificial radioactivity and transmutation ought to be done, for best results, with really pure elements; the word pure being used in its physical as well as chemical meaning.

Dr. Hertz uses the diffusion technique

for separating the neon isotopes. A battery of tubes containing porous material is filled with pure neon gas as obtained chemically. Mercury vapor pumps drive the neon through the system. As the gas comes to the porous material, the lighter kind of neon passes through a little faster than the heavier kind because of the difference in the diffusion rates.

The lighter fraction passes back to the opposite side of the porous tube and repeats the process while the heavier fraction passes on to the second porous tube, then to a third, and so on. Each porous tube has the return system whereby the lighter isotope is each time returned to repeat the diffusing process. Continuous operation and circulation of the gases is maintained by the pumping system.

Starting with the original neon gas in the ratio of 9.3 parts of isotope of mass 20 to one part of isotope of mass 22, only one hour is needed to bring them to equal concentrations. Five hours suffice to bring the heavier isotope up to 98 to 99 per cent. concentration.

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BOTANY

X-Rayed Bulb Produces Lily That Never Sheds Pollen

AN "X-RAY lily" that keeps its petals shining white by never shedding its pollen on them has been originated in the research laboratories of the General Electric Company, by C. N. Moore. The new variety has been given the provisional name of "Roentgen Regal Lily," in honor of the discoverer of X-rays, and patent to protect it has been applied for.

Many species of lily have the habit of shedding pollen from their big yellow anthers as these ripen and burst. The yellow dust, scattered on the shining petals, disfigures the flowers in the opinion of many purchasers. Florists also claim that if this fertilizing dust falls on the receiving surface of the pistil, the flower dies sooner.

For this reason, florists generally tear off the anthers as soon as the lily opens.



ROENTGEN REGAL LILY

This beautiful flower has the peculiar virtue of never shedding its golden pollen.

This, however, is a tedious hand job, adding to the cost of the flowers. Moreover, to many flower lovers these de-anthered lilies appear simply mutilated. A lily that can keep its golden anthers and yet not shed pollen on the petals is therefore a very desirable thing.

Mr. Moore started four years ago toward the goal he has finally attained. He treated three lots of regal lily bulbs to varying doses of X-rays. Most of them did not show any effect, though a few did produce deformed or otherwise freakish flowers.

Two bulbs, however, gave rise to new generations of bulbs which produced flowers with non-shedding anthers, and these were the vegetative ancestors of the stock he now has blossoming. The natural-appearing pollen-sacs swell up in the usual fashion, but never burst. Instead, they finally begin to dwindle slowly, and the pollen is never liberated.

Science News Letter, September 21, 1935

PLANT PATHOLOGY

Willow Disease Threatens Cricket, Sport of English

SUPPOSE Lou Gehrig's bat should break every time he hit a ball.

Suppose every baseball player's bat should break, every time anybody hit a ball.

That nightmare situation is what menaces cricket, which means even more to English boys than baseball does to young Americans—if that can be imagined. The cricket-bat willow, main reliance of the game, is afflicted with a widespread epidemic known as watermark disease, which

makes its wood unfit for shaping into the flat-sided bats used in the great British sport.

The disease is due to a swarming bacterium, which was described before the meeting of the British Association for the Advancement of Science by Dr. W. J. Dowson, specialist in fungi at Cambridge University. The cause of the disease had been identified by an earlier worker, and Dr. Dowson confirmed his results, against which doubts had been raised later.

Watermark disease afflicts 25,000 cricket-bat willows in one English willow-raising region alone, Dr. Dowson

said. The dead trees, left standing, spread the epidemic among those still living.

When watermark disease attacks a willow, the leaves wither and turn brown prematurely, and then drop off. Volunteer shoots sprout from the living tissue below the dead wood. After two or three years, the tree dies completely, and a bacterial ooze comes out of chance small wounds.

The wood has a water-soaked appearance, and is darkly marked in streaks and patches. Masses of bacteria are crowded in its water-conducting vessels. It is utterly unfit for use.

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ASTRONOMY

New Asteroid Takes 7 Years For Journey Around the Sun

DEFINITELY an asteroid, but a most peculiar one, is astronomy's verdict on the strange celestial object imaged on a photographic plate at the Mount Wilson Observatory, California. The photographic record of its appearance was discovered by Dr. Edwin P. Hubble, and measured by Dr. Seth B. Nicholson.

The newly discovered asteroid is remarkable for two things: the large eccentricity and the high angle of its orbit, which has just been calculated independently by two astronomers, Prof. Harlow Shapley, director of the Harvard College Observatory, informed Science Service. One of the computations was made by L. E. Cunningham, of Harvard, and the other by Dr. Paul Herget of the University of California. Both were reported to the clearing-house for astronomical information maintained at the Harvard College Observatory.

These two preliminary orbit-calculations show the new asteroid to have a period of revolution around the sun of seven years. The orbit is a long ellipse, with the sun well to one side of center. It is, moreover, inclined at an angle of forty degrees to the ecliptic, or path of the planets. Its position, far outside the zodiacal belt in which the great majority of asteroids move, first attracted attention to it as something really unusual.

At present the asteroid, which is too small to be seen without a telescope, is in the constellation Cassiopeia. Cassiopeia is a W-shaped group of stars in the northern sky, on the opposite side of the Pole Star from the Great Dipper.

Additional observations have been made at Harvard College Observatory, which will permit the more accurate determination of the orbit.

Science News Letter, September 21, 1935

MEDICINE

Claims Electricity Better Than Malaria for Fever Treatment

ELECTRICAL methods of inducing fever are better than malaria for the treatment of the mental disease resulting from syphilitic infection, Dr. Ralph H. Kuhns of the University of Illinois College of Medicine told members of the American Congress of Physical Therapy.

Dr. Kuhns based his opinion on experience with both forms of treatment of

dementia paralytica in the state hospitals of Illinois.

Most important for the success of fever treatment, regardless of the method used to induce the fever, is starting the treatment early before serious mental deterioration has set in, Dr. Kuhns emphasized.

"In producing remissions and possible cures in many patients who were former-

ly given up as hopeless, we have effected a tremendous saving for the taxpayers of the state of Illinois, in addition to ameliorating the ravages of this dread disease," he said.

One of his objections to infecting the patients with malaria in order to produce the curative fever is the high death rate among patients treated with malaria. In the Elgin State Hospital this was 12 per cent., higher than for any other form of treatment. In addition to the danger to the patient, there is the possible danger of introducing malaria into the rest of the hospital population or possibly into the community outside the hospital. Dr. Kuhns quoted a recent statement of Dr. H. J. Shaughnessy, of the Illinois state health department, calling attention to this danger.

Of the various electrical methods of inducing high curative fever in the patients, Dr. Kuhns reported that he and his associates found the electric blanket safest and simplest. The blanket is about six feet square and is plugged by a connecting cord into an electric socket in the wall. The patient is first wrapped in blankets and then covered by the electrically heated blanket.

Three hundred patients have been treated by this method during the last five years at the Elgin State Hospital and the State Psychopathic Institute. Nearly three-fourths of these were definitely improved, one-tenth remained stationary, 7 per cent. deteriorated and 11 per cent. died. Nearly one-third of the improved patients were discharged by the Elgin State Hospital and 14 per cent. are now on parole.

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GENERAL SCIENCE

Plea for Linguistic Mercy Made to Soviet Scientists

RUSSIAN language, in its baffling Cyrillic alphabet, is too much of a hurdle for Western scientists who need to know what is in Russian scientific publications; wherefore Russian researchers are asked if they will not kindly announce their discoveries in English, German or French, by Prof. Horace Elmer Wood, 2d, of Dana College, Newark, N. J. (*Science*, Aug. 30).

The older scientific literature of Russia, Prof. Wood states, was usually published in one of the three languages most widely used among scientists. But even before the War and the Revolution, beginning about with the present century, Russian scientists began printing in their own vernacular, often giving exceedingly