TECHNOLOGY

Cheaper Active Carbon

A simple process by which active carbon may be manufactured from anthracite may now be achieved, recent investigations indicate.

➤ ACTIVE CARBON, widely used as an adsorber of gas impurities in air and of color and odor in water, may some day be obtained cheaply from anthracite coal, recent investigations at State College, Pa., indicate. Obtaining active carbon from anthracite is not new, but a simple process by which it can be manufactured cheaply, one object of the investigation, may now be achieved. The raw material is plentiful, the process not costly. It is a direct activation by selective oxidation with steam.

During World War I, anthracite was steam-activated on a commercial basis to yield the coal carbon, a moderately good gasmask carbon when compared with good carbons made from coconut shells. Later, steam-activated unbriquetted anthracites were prepared that were equal or superior to the coal carbon in activity; yet, it appeared that anthracite, generally, had never been raised to the highest activity possible commensurate with the weight loss during activation and the ash content of the activated material.

In the present work, carried out at the Pennsylvania State College by three members of the staff, J. D. Clendenin, W. T. Griffiths and C. C. Wright, the activation characteristics of several different anthracites, and of three specific gravity fractions of one anthracite, were examined by subjecting the coals to steam activation in a stainless steel retort. The different anthracites were high, medium and low-volatile types.

In general, the approximate yield of active carbon from the three coals was about triple the yield from commercial coconut shell, but the adsorption power was less. A hundred pounds of the active carbon from the medium volatile coal adsorbed 50 pounds of carbon tetrachloride, the high-volatile product slightly less and the low-volatile coal carbon 38 pounds of the compound. Commercial coconut shell active carbon adsorbed 68% of its own weight in carbon tetrachloride.

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CHEMISTRY

Synthetic Rubber Theory

Secret war process that shows how it is formed from oils agitated in soapy water described to National Academy by Dr. Harkins.

➤ A WAR SECRET theory that explains how synthetic rubber is formed from chemicals agitated in a soap solution similar to that on soapy hands was revealed to the National Academy of Sciences by Prof. William D. Harkins, University of Chicago chemist.

Differing from German theories which Prof. Harkins terms "naive", the theory developed in 1942-3 has molecules of the butadiene-styrene oil mixture standing upright like soldiers on parade upon the water surface between layers of soap molecules. In these oil layers very short single "monomer" molecules grow into much longer molecules, sometimes 1,000 to 15,000 joining to make one single long chain polymer molecule. When the long molecules coil up and become too thick to be held between the soap molecules they are ejected as rubber particles, many of them as small as a third of a millionth of an inch in diameter. Almost all the rubber produced in the United States grows in these minute spheres.

Since the manufacture of synthetic rubber was one of the major industrial tasks of the war, Prof. Harkins spent three years under the auspices of the Office of Rubber Reserve in a thorough test of this fundamental theory.

The rubber growth theory applies equally well to the manufacture of many other plastics.

Prof. Harkins presented startling facts about what happens in the submicroscopic chemical world:

Soap solutions dissolve oils in extremely thin layers and this gives the oil an extremely large area: ten acres per cubic inch of oil.

The thinness and large area cause the rubber particles formed to be so small that a cubic inch of oil forms 200 billion of these small spheres.

Each of us produces these oil layers whenever we wash our hands with soap.

The theory of orientation of molecules upon surfaces, developed about 30 years ago by Dr. Harkins, Dr. A. C. Langmuir of the General Electric Company and the British scientist, Hardy, has "revolutionized not only one of the branches of chemistry, but is also having a profound influence in biology."

Science News Letter, May 4, 1946

CHEMISTRY

Latest Antibiotic Comes From Wild Ginger

➤ GRANDMOTHERS and great-grandmothers who dosed the family with wild ginger tea had something, it now appears.

The latest antibiotic, or penicillin type of anti-germ disease remedy, to be announced comes from wild ginger, technically known as *Asarum canadense*.

The discovery of two antibiotics produced by this plant was made by Dr. C. J. Cavallito and Dr. John Hays Bailey of the Winthrop Chemical Company research laboratories at Rensselaer, N. Y.

One of the wild ginger antibiotics, labelled A, is a colorless compound active against pus-forming germs. Staphylococci, streptococci and pneumonia germs are affected by it. The other antibiotic, called B, is a lemon-yellow acid with less anti-germ activity.

The anti-biotics in wild ginger were discovered in the course of a search for such agents in higher plants. So far about 200 local New York State plants have been screened. Of these, garlic and burdock have also been found to produce antibiotics.

Wild ginger is abundant in woods from New Brunswick to Manitoba in Canada and as far south as North Carolina, Missouri and Kansas. Other popular names for it are false coltsfoot, asarabaca, Canadian snakeroot and colic root.

Although 98% of the old-fashioned home remedies that made use of plants and herbs may have been merely harmless, Dr. Cavallito is quoted as now viewing the home remedies with "a less sneering attitude than formerly."

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