Teflon Encyclopedia Article

Teflon

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Teflon

Teflon is a fluorocarbon polymer known by the chemical name polytetrafluoroethylene. It is a slippery material that is chiefly known for its use in nonstick cookware and heart valves. It was first used in the gaskets and valves needed to concentrate Uranium 235 and resist the highly corrosive uranium hexaflouride gas.

Roy J. Plunkett of New Carlisle, Ohio, accidentally discovered Teflon. Plunkett graduated from Manchester College in 1932 with a B.A., and received a PH.D from Ohio State University in 1936. There he became friends with future Nobel Prize winner Paul Flory (1910-1985). He then went to work at Du Pont's laboratories to research refrigerants, namely flourochlorohydrocarbons. To facilitate that research, he needed about 100 lbs. (45 kg) of tetraflouroethylene.

He developed a small pilot plant to produce the chemical, which was then stored in cylinders in a cold box. During a subsequent experiment on April 6, 1938, Plunkett and his assistant Jack Rebok realized that a full cylinder apparently contained no gaseous tetraflouroethylene. Instead of simply getting another tank, Plunkett began to investigate. Plunkett checked the valve on the tank and found a white powder. When he sawed the tank open it was full of a slippery, white, waxy substance. He theorized that the gas had polymerized.

Teflon, as it came to be known, is resistant to strong acids, bases, heat, and solvents. Initially, it was extremely expensive to produce and was unavailable to the general public until 1960. It played an important role in the war effort, and in peacetime has come to be used in cookware, electrical insulators, space suits, and as nose cones, heat shields, and fuel tanks for space vehicles. Because Teflon is essentially inert, the body does not reject it, so it is used in artificial limb and joint replacements, sutures, heart valves, and pacemakers.