A pitch is disclosed which is used as a raw material for making carbon fibers. The pitch has a quinoline insoluble content of 7-18% by weight and a toluene insoluble content of 70-90% by weight. Further, the pitch preferably has a n-heptane soluble content of 1.0% by weight or less. A process for producing the pitch is also disclosed. The process comprises carrying out thermal modification of a petroleum heavy residual oil having a boiling point of 400 degrees C. or more (atmospheric pressure) and a sulfur content of 1.5% by weight or less. Insoluble substances are then separated and removed by heating at a temperature of 380 degrees C. or less. Thereafter, a low boiling point fraction is removed by vacuum distillation. The pitch can be utilized to produced carbon fibers without breaking of filaments in spinning or adhesion by fusion of the fibers in infusibilization. The carbon fibers produced have a high tensile strength and high modulus of elasticity.

4600496

PITCH CONVERSION

Paul Cheng, Tammy M Elkins assigned to Phillips Petroleum Company

Pitch is converted to mesophase pitch in the presence of catalytically effective amounts of oxides, diketones, carboxylates and carbonyls of metals selected from vanadium, chromium, molybdenum, iron, nickel and cobalt. The crystalloidal or mesophase pitch obtained can be used for the production of carbon fibers and other carbon and graphite products and articles of manufacture of unusually high quality.

4600572

ULTRAHIGH STRENGTH CARBON FIBERS

Tohru Hiramatsu, Yohji Matsuhisa, Tomitake Higuchi, Matsuyama, Japan assigned to Toray Industries Inc

An ultrahigh strength carbon fiber having a surface layer having a crystalline completeness which is substantially the same as or higher than that of the central region of the fiber, and a functional group amount ratio (Ols/Cls) of 0.1 to 0.4 as detected in the fiber surface by X-ray photoelectron spectroscopy, the surface layer preferably having an ultrathin outermost layer having a lower crystalline completeness than the central region of the fiber.

4600642

RADAR WAVE DIPOLE OF COPPER COATED CARBON FIBERS

Kevin J Lodge, Jac Brettle, Synsham, Nr Brackley, United Kingdom assigned to Plessey Overseas Limited

Small lengths of conductors, cut to the appropriate size are used as radar chaff or passive reflectors to give spurious returns on an enemy radar and thereby act as an electronic countermeasure. Currently used chaff includes chopped aluminum foil, aluminum coated glass fibres and silver coated nylon monofilaments. Current radars operate in the 1010 Hz region and current chaff dipoles are of centimetric size, but future radar systems are likely to operate at higher frequencies requiring shorter dipoles lengths to achieve an increased packing density the dipoles also need to be thinner. Carbon fibres have advantages over existing chaff materials as they are fine, light and much stiffer than existing chaff materials. The electrical resistance is about 1000*higher than that of aluminum however and this invention therefore proposes the use of carbon fibres coated with a much more conductive coating. Typical coating materials can be copper, silver aluminium applied by a number of different methods.

4600661

COMPOSITE MATERIAL WITH CARBON REINFORCING FIBERS AND MAGNESIUM ALLOY MATRIX INCLUDING ZINC

Tadashi Dohnomoto, Atsuo Tanaka, Toyota, Japan assigned to Toyota Jidosha Kabushiki Kaisha

This composite material includes reinforcing carbon fibers and a matrix metal which is an alloy containing from 2% to about 8% by weight of Zn, less than about 2% by weight of Zr, less than about 1% by weight of Al, and balance substantially Mg. Thereby, the strength of the composite material is found to be substantially improved. Preferably, the content of Zn in the matrix metal may be from 3% to about 7.5% by weight, even more preferably this content of Zn in the matrix metal may be from 4.5% to about 7% by weight, and optimally it may be 6% by weight. Preferably, the content of Zr in the matrix metal is less than about 0.18% by weight, and preferably