38.02 - Activated carbon; activated natural mineral products; animal black, including spent animal black.

3802.10 - Activated carbon

3802.90 - Other

(A) ACTIVATED CARBON; ACTIVATED NATURAL MINERAL PRODUCTS

Carbon and mineral substances are said to be activated when their superficial structure has been modified by appropriate treatment (with heat, chemicals, etc.) in order to make them suitable for certain purposes, such as decolourising, gas or moisture adsorption, catalysis, ion-exchange or filtering.

These products fall in two groups :

(I) Products generally characterised by a very large specific surface (of the order of hundreds of square metres per gram), and by the presence of van der Waal's bonds (physical adsorption) or free chemical bonds saturable by organic or inorganic molecules (chemical adsorption).

These products are obtained by chemical or heat treatment of certain vegetable or mineral substances (clay, bauxite, etc.) in the presence of natural impurities or added foreign matter. This treatment causes a change in the structure of the basic substance, accompanied by an increase in the specific surface, and, in the case of crystalline substances, distortions in the lattice due to the insertion or substitution of atoms with different valencies. The valencies which thus remain free can cause the condensation of protons or electrons on the surface, rendering the product active as a chemical adsorbent, a catalyst or an ion-exchanger.

(II) Products which generally have a fairly small specific surface (of the order of 1 to 100 m^2/g). Although they generally have a high electrical charge density, these products have no marked capacity for adsorption and therefore are not decolourising agents. On the other hand, in aqueous suspension they establish powerful electrostatic interactions with colloids, facilitating or inhibiting their coagulation, and are therefore suitable for use as filtering agents.

Products of this type are also generally obtained by appropriate heat treatment. The presence of alkaline substances during the calcining process sometimes encourages the formation of surface charges.

The heading includes :

(a) **Activated carbon**. This is usually obtained by treating vegetable, mineral or other carbon (wood charcoal, coconut shell carbon, peat, lignite, coal, anthracite, etc.) at a high temperature in the presence of steam, carbon dioxide or other gases (gas activation), or by dry calcination of cellulosic materials impregnated with solutions of certain chemicals (chemical activation).

Activated carbon is used as a fine powder for decolourising liquids in many industries (sugar or glucose manufacture, oil or wine industry, medicaments, etc.). In the form of grains, it is used for adsorbing vapours (for example, in recovering volatile solvents during dry-cleaning processes, removing benzene from coal gas), for purifying water or air, as a protection against toxic gases, in catalysis, or for eliminating the accumulation of gas at the electrodes during electrolysis (depolarisation).

(b) **Other activated natural mineral products such as :**

(1) **Activated diatomite**. This consists of kieselguhr or other selected siliceous fossil earths, decalcified if necessary by means of acids, calcined in contact with sintering agents such as sodium chloride or sodium carbonate and then ground and graded by appropriate means. Diatomite calcined without the addition of sintering agents is, however, **excluded** (**heading 25.12**).

(2) **Certain volcanic minerals**, such as perlite, which, after grinding, are subjected to a thermal " shock " in a very hot flame (1000 ºC or over), and then re-ground and graded. Activated perlite is in the form of a very light shiny powder. On microscopic examination it is seen to consist of very thin, transparent flakes having curved surfaces.

The two types of products cited at (1) and (2) above are of very low apparent specific gravity and are filter media chiefly used in the preparation of chemical or pharmaceutical products (especially antibiotics), in sugar or glucose manufacture, in processing beverages, for filtering water, etc.

(3) **Activated clays and activated earths**. These consist of selected colloidal clays or clayey earths activated, according to their intended use, by means of an acid or an alkali, dried and then ground. When activated by means of an alkali, they are emulsifiers, suspension agents and agglomerating agents; these are used, in particular, in the manufacture of polishing or cleaning preparations, and, because of their swelling properties, for improving foundry sands and drilling sludge. When activated by means of an acid, they are mainly used for decolourising animal, vegetable or mineral oils, fats or waxes.

(4) **Activated bauxite**. Bauxite is usually activated by means of alkalis or by suitable thermal treatment. It is chiefly used as a catalyst, a desiccant and a decolourising agent.

The heading also **excludes** :

(a) Naturally active mineral products (e.g., fuller's earth), which have not undergone any treatment modifying their superficial structure (**Chapter 25**).

(b) Activated chemical products such as activated alumina (**heading 28.18**), activated silica gel (**heading 28.11** or **38.24**), artificial zeolite ion-exchangers (**heading 28.42** or, if containing binders, **heading 38.24**) and sulphonated coal ion-exchangers (**heading 38.24**).

(c) Activated carbons having the character of medicaments (**heading 30.03** or **30.04**) or put up in packings for retail sale as deodorisers for refrigerators, cars, etc. (**heading 33.07**).

(d) Catalysts consisting of a chemical product (e.g., a metallic oxide) fixed on a support of an active material (e.g., activated carbon or diatomite) (**heading 38.15**).

(e) Expanded perlite in the form of light-weight spheroidal granules (**heading 68.06**).

(B) **ANIMAL BLACK, INCLUDING SPENT ANIMAL BLACK**

This group covers the different varieties of black obtained by carbonising materials of animal origin, in particular :

(1) **Bone black** obtained by calcining defatted bones in a closed vessel. It is a porous black product containing only a low content of pure carbon (about 10 to 20 % of its weight unless treated with acid, in which case the carbon content is much higher). It is in the form of powder, grains, paste, or pieces having the shape of the bones or pieces of bone used for its preparation. Bone black is a decolourising agent widely used in many industries, especially the sugar industry, and is also employed as a black pigment, for example, in the manufacture of polishes and certain inks.

Spent bone black is used as a fertiliser and also for the manufacture of black pigments.

(2) **Blood black** obtained by calcining dried blood in a closed vessel. It is generally used as a decolourising agent.

(3) **Ivory black** obtained by calcining ivory waste. This product, usually presented as a very fine, velvety black powder or small, irregularly-shaped cones, is used in artists' colours.

(The term " ivory black " is sometimes used to describe special grades of bone black.)

(4) **Leather black, horn black, hoof black, tortoise-shell black**, **etc**.