

Processing Committee: Recommendation Activated Carbon

Introduction: The NOSB received a petition to consider activated carbon to remove brown color from white grape juice concentrate.

Background: Activated carbon is distinguished from elemental carbon by the removal of all non-carbon impurities and the oxidation of the carbon surface. Activated carbon can be divided into four basic forms: *Animal charcoal* is obtained by charring bones, meat, blood, etc; *Gas black, furnace black or channel black* is obtained by the incomplete combustion of natural gas; *Lamp black* is obtained by burning various fats, oils, resins, etc., and *Activated charcoal* is prepared from wood and vegetables (hardwoods, grain hulls, corn cobs, nut shells, etc.).

Mechanical filtration involves the physical separation of suspended solids from a liquid passing through carbon arrayed as a porous media in a column or bed. The effectiveness of filtration depends on particle size, bulk density and hardness. Carbon can be reused if the absorbed substances are removed. This process is known as regeneration.

Charcoal dates back to the prehistoric discovery of fire. Use for removal of taste and odor from municipal water supplies in the U.S. began in about 1929. Activated carbon is currently not listed in any published U.S. certifier standards. Activated carbon is listed internationally (CODEX, EU 2092/91, IFOAM, Canada) for use as a processing aid for the preparation of organic food. International listings included in TAP do not place any restrictions on the use of activated carbon as a processing aid.

Activated carbon can be and is produced from a broad array of agricultural by-products. Natural commercially available sources include: nut shells, fruit pits (coconut shells), almond shells, olive pits, peach pits, pecan shells, plus oat hulls, rice hulls, rice straw and soybean hulls plus some tree species can be used to produce wood converted into charcoal. Agricultural by-products can be chemically activated using a variety of acids and bases. One acid mentioned in the TAP is acetic acid, found in vinegar. Potassium hydroxide and sodium hydroxide (both are currently listed NOP 205.605 (b) as allowed synthetics) are both mentioned as possible bases. Organic acetic acid can be obtained either from organic vinegar or by the destructive distillation of carbon sources as a by-product of the charcoal-making process. The TAP review indicates that activated carbon can be produced as an organic ingredient. Activated carbon is GRAS by the FDA.

The petitioned use is to remove the brown color (caused by oxidation) from white grape juice. Therefore, the primary purpose in the petition is to improve flavor and color. Alternatives listed in the TAP review include the selection of lighter colored varieties, cold pressing, freezing, centrifuging and enzyme treatment. The TAP also notes that judging the similarity of concentrate produced without activated carbon is difficult without specific color and flavor specifications. One reviewer noted that use of activated carbon appears to provide a more controllable, effective and perhaps cost effective approach than the listed alternatives. Another reviewer felt the disallowance of activated charcoal would affect the organic sweetener in a big way.

The reviewers and the committee unanimously found activated carbon to be synthetic. The reviewers also unanimously voted to add activated carbon to the national list. One reviewer suggested as a processing aid only and that it should meet CODEX purity requirements; another suggested for filtering water only and the third recommended activated carbon without any restrictions. The TAP indicated that the environmental effects of use are generally considered beneficial.

The committee considered activated charcoal to be similar (in some ways) to other filtering aids on the National list such as diatomaceous earth and perlite, but did not find specific references depicting them as viable alternatives for this application. The processing committee offers the following recommendation.

Recommendation:

205.605 (b) Synthetics allowed:

Activated Carbon – from vegetative sources only for use as a filtering aid.

Committee Vote:

Approve – 5
Disapprove - 1
Recuse – 1
Absent - 0
Abstain - 0

Conclusion: This recommendation supports the use of activated carbon from vegetative sources only as a filtering agent while recognizing the vast array of agricultural by-products (natural sources) commercially available.