The present invention relates to the production of charcoal from wood and has for its object the transformation of wood into highly active charcoal in granular form.

Attempts to attain this object by impregnating the wood with alkali and by subsequent carbonization have failed, as the material crumbled to powder when glazed. According to the present invention the problem is solved in a very satisfactory manner by heating wood cut into small bits at a moderate temperature, for instance, 400–500° C., under exclusion of air, until complete carbonization has been effected; by then impregnating the material with alkali and completing the carbonization process by heating to brightest red heat, for instance, at a temperature of 1000–1100° C., under exclusion of air.

The first heating (400–500° C.) is continued until the wood is completely carbonized. Both heatings are carried out under exclusion of air.

For the impregnation, saturated or highly concentrated solutions are preferably used with which the product from the first heating is saturated.

It has further been discovered that a highly active coal in granular form is obtained when the wood cut into small bits is first carbonized under exclusion of air at a moderate temperature, for instance at dark red heat, whereupon the product from carbonization is saturated with alkali, e.g., potash, and in finishing the carbonization process by heating under exclusion of air the substance to a high temperature, e.g., brightest red heat.

Examples.

1. The wood cut into small bits of for instance 2–5 millimeters is heated to 400–500° C., under exclusion of air, so that it preserves generally its shape. The coal obtained is saturated with a solution of potash or of potassium hydroxide, alkali being eventually added. The mass obtained is then heated under exclusion of air to brightest red heat, e.g., up to 1300° C. or even more. The carbon which is thus produced, and which on the whole has preserved the shape of the initial material, is washed (eventually with addition of acids) and dried.

A coal of even greater activity is obtained when for the saturation of the wood instead of alkali, suitable electrolytes, that is to say salts of an alkali or an acid are used which does not cause the swelling of the mass when the wood is being heated, the wood which has been thus preliminarily treated being carbonized at moderate temperature, whereupon, after lixiviation of the electrolyte and incorporation of alkalis, the final carbonization is carried through at high temperature in presence of the alkalis.

2. Wood cut into small bits is saturated with a concentrated solution of chloride of calcium and heated under exclusion of air up to about 400° C. The product from carbonization is freed from the chloride of calcium by lixiviation, dried eventually, and impregnated with potash or with caustic potash solution. Active charcoal is obtained through heating under exclusion of air to about 1000 to 1100° C., said charcoal preserving on the whole the form of the initial material.

The product thus obtained is lixiviated with water and dried. The alkali solution obtained in lixiviating can be used again for impregnating fresh quantities of wood.

The charcoal produced according to this process is a granular product whose absorbing capability is equal to or exceeds that of the best animal charcoals and blood charcoals, obtainable in commerce.

I claim:

1. The improved method for the production of active carbon in granular form which consists in carbonizing under exclusion of air at a temperature of 300 to 500° C. wood cut into small bits under exclusion of air at a temperature of 300 to 500° C. wood cut into small bits impregnated with an electrolyte which does not make the wood swell, in freeing the product of the electrolyte in incorporating alkali in the product and in
heating the product under exclusion of air at bright red heat.

3. The improved method for the production of active carbon in granular form which consists in carbonizing under exclusion of air at a temperature of 300 to 500° C. wood cut into bits of a size of 2 to 5 mm. impregnated with a solution of chloride of calcium, in freeing the product of the electrolyte, in incorporating alkali in the product and in heating the product under exclusion of air at bright red heat.

4. The improved method for the production of active carbon in granular form which consists in carbonizing under exclusion of air at a temperature of 300 to 500° C. small bits of wood, in saturating the product with a concentrated solution of alkaline compounds and in heating the product under exclusion of air at bright red heat.

5. The improved method for the production of active carbon in granular form which consists in carbonizing under exclusion of air at a temperature of 300 to 500° C. small bits of wood impregnated with an electrolyte which does not make the wood swell, in freeing the product of the electrolyte, in saturating the product with a concentrated solution of alkaline compounds and in heating the product under exclusion of air at bright red heat.

6. The improved method for the production of active carbon in granular form which consists in carbonizing under exclusion of air at a temperature of 300 to 500° C. wood cut into small bits and impregnated with a solution of chloride of calcium, in lixiviating the product with a concentrated solution of alkaline compounds and in heating the product under exclusion of air at bright red heat.

7. The improved method for the production of active carbon in granular form which consists in carbonizing under exclusion of air at a temperature of 300 to 500° C. small bits of wood, in saturating the product with a solution of caustic potash and in heating the product under exclusion of air at bright red heat.

8. The improved method for the production of active carbon in granular form which consists in carbonizing under exclusion of air at a temperature of 300 to 500° C. small bits of wood impregnated with an electrolyte which does not make the wood swell, in freeing the product of the electrolyte, in impregnating the product with concentrated caustic potash solution and in heating the mass under exclusion of air at bright red heat.

9. The improved method for the production of active carbon in granular form which consists in carbonizing under exclusion of air at a temperature of 300 to 500° C. small bits of wood which have been impregnated with a solution of chloride of calcium, in freeing the product of the chloride of calcium by lixiviation, in impregnating the product with concentrated caustic potash solution and in heating the mass under exclusion of air at bright red heat.

10. The improved method for the production of active carbon in granular form which consists in carbonizing under exclusion of air at a temperature of 300 to 500° C. small bits of wood, in saturating the product with a concentrated solution of potassium hydroxide, and in heating the product under exclusion of air at bright red heat.

11. The improved method for the production of active carbon in granular form which consists in carbonizing under exclusion of air at a temperature of 300 to 500° C. small bits of wood, in impregnating the product with an electrolyte which does not make the wood swell, in freeing the product of the electrolyte, in impregnating the product with a concentrated solution of potassium hydroxide and in heating the mass under exclusion of air at bright red heat.

12. The improved method for the production of active carbon in granular form which consists in carbonizing under exclusion of air at a temperature of 300 to 500° C. small bits of wood impregnated with a solution of chloride of calcium, in freeing the product of the chloride of calcium, in lixiviating the same with a concentrated solution of potassium hydroxide and in heating the same at bright red heat.

13. The improved method for the production of active carbon in granular form which consists in carbonizing under exclusion of air at a temperature of 300 to 500° C. small bits of wood, in incorporating alkali in the product, in heating the product under exclusion of air at bright red heat, in lixiviating the product from the second heating and in drying the same.

In testimony whereof I have signed my name to this specification.

Dr. PAUL WÖHLER.