A method for manufacturing pure salt is provided. The pure salt manufacturing method includes the steps of heating solar salt at 200°C to dry moisture contained therein, placing the dried salt in a heating kiln and heating the same at 1300°C to be liquefied for primary melting, diluting the molten salt with clean water to sediment heavy metals or impurities contained therein, separating only brine from the resulting material and heating the same to evaporate moisture contained therein, heating moisture-evaporated salt to produce crystallized salt, placing the crystallized salt in the heating kiln and heating the same at 1500°C for secondary melting, diluting the secondarily molten salt with clean water to secondarily sediment heavy metals or impurities contained therein, separating unseparated brine and heating the same to produce crystallized salt, placing the crystallized salt in the heating kiln and heating the same at 1800°C for third melting, diluting the thirdly molten salt with clean water to sediment impurities contained therein, separating unseparated brine and heating the same to produce crystallized salt, placing the crystallized salt in the heating kiln and heating the same at 2000°C for fourth melting, separating an upper layered portion of the molten salt from a lower layered portion, coagulating the separated molten salt and pulverizing the coagulated salt to produce powdered salt. Thus, various heavy metals contained in solar salt are effectively removed, thereby obtaining harmless salt.
FIG. 1

DRYING

PRIMARY MELTING

DILUTION-SEDIMENTATION

SEPARATION-EVAPORATION

SECONDARY MELTING

DILUTION-SEDIMENTATION

SEPARATION-EVAPORATION

THIRD MELTING

DILUTION-SEDIMENTATION

SEPARATION-EVAPORATION

FOURTH MELTING

SEPARATION

COAGULATION-PULVERIZATION
METHOD FOR MANUFACTURING PURE SALT

TECHNICAL FIELD

[0001] The present invention relates to a salt preparation method, and more particularly to a method for preparing nontoxic pure salt by removing from solar salt various impurities such as heavy metals contained in the solar salt.

BACKGROUND ART

[0002] Solar salt is made by evaporating water from sea water. Recently, according to sea pollution, the solar salt made from polluted sea water contains various heavy metal components or impurities. Known are various processed salts which are prepared by removing impurities contained in the solar salt, and processing methods thereof. Known processed salts include remanufactured salt, baked salt, washed salt, bamboo salt, refined salt and so on.

[0003] The remanufactured salt is prepared by dissolving solar salt in water, boiling the dissolved solar salt in a pot at 100 to 200°C and recrystallizing. However, the remanufactured salt has a disadvantage that heavy metals or impurities cannot be sufficiently removed.

[0004] The baked salt is prepared by primarily baking solar salt in reaction kiln at 400 to 450°C for 1 to 4 hours, secondarily baking at 550 to 600°C for 30 minutes to 4 hours, and thirdly baking at 700 to 800°C for 30 minutes to 4 hours. Organic matter and arsenic (As) are substantially removed in the primarily baking step, As, oxide and cadmium (Cd) are removed in the secondary baking step, and lead (Pb), refractory organic matter or calcium (Ca), or magnesium (Mg) containing oxide are removed in the third baking step. However, this process involves complexity in adjusting the temperature, step. More disadvantageously, if the temperature is not accurately adjusted by step, harmful materials are not removed but minerals only are removed.

[0005] The washed salt is prepared by pulverization, washing, dehydration and drying, so that the content of insoluble matter is reduced to 0.02% or less, and magnesium chloride and sodium sulfate are reduced to 0.05% or less. The washed salt has larger crystal and is hard. Thus, while the washed salt per se can be used as food Farads salt, it became inadequate as food grade salt when it is used together with additives added for preventing coagulation of salt in the course of pulverization.

[0006] The bamboo salt is prepared by placing solar salt placed in a bamboo tube, scaling the entrance of the bamboo tube with clay, repeatedly baking the sealed bamboo tube in a pot at 1000 to 1300°C 8 times, and then spraying rosin powder over a wood fire to raise the baking temperature to bake at 1300 to 1700°C. Here, the nuclear As contained in the solar salt is combined with sulfur, rosin or iron in the bamboo to be turned into an alkali material, which is useful to human body. However, the heavy metals or impurities contained in the solar salt can not completely be removed by heating the solar salt at higher temperature.

[0007] The refined salt is prepared by passing sea water through an ion exchange membrane and extracting only NaCl, and is of high purity. Also, since the refined salt has fewer impurities, that is, highly hygienic, and has particles of constant size, it is widely used as home, food or industrial grade salt. However, the refined salt production is an unfavorably energy-consuming process.

DISCLOSURE OF INVENTION

[0008] To solve the above problems, it is an object of the present invention to provide a method for manufacturing pure salt, which is nontoxic and pleasant to the taste, by completely removing impurities that are harmful to the human body, such as heavy metals, contained in solar salt.

[0009] To achieve the above object, there is provided a method for manufacturing pure salt, including the steps of placing solar salt in a heating kiln and heating the same at a predetermined temperature to dry moisture contained in the solar salt, placing the dried salt in a heating kiln and heating the same at a high temperature to be liquefied for primary melting, diluting the molten salt with clean water to sediment heavy metals or impurities contained in the salt, separating only brine from the resulting material and heating the same to evaporate moisture contained in the brine, heating moisture-evaporated salt to produce crystallized salt, placing the crystallized salt in the heating kiln and heating the same at a higher temperature than that of the first melting for secondary melting, diluting the secondarily molten salt with clean water to secondarily sediment heavy metals or impurities contained therein, separating unseparated brine and heating the same to produce crystallized salt, placing the crystallized salt in the heating kiln and heating the same at a higher temperature than that of the secondary melting for third melting, diluting the thirdly molten salt with clean water to sediment impurities contained therein, separating unseparated brine and heating the same to produce crystallized salt, placing the crystallized salt in the heating kiln and heating the same at a higher temperature than that of the third melting for fourth melting, separating an upper layered portion of the molten salt from a lower layered portion, cogulating the separated molten salt, and pulverizing the cogulated salt to produce powdered salt.

[0010] In the pure salt manufacturing method according to the present invention, heating, sedimentation and separation, and melting are repeatedly performed, and melting steps are performed with heating temperatures being gradually raised, various kinds of heavy metals and impurities contained in the solar salt can be removed in each step for complete removal.

BRIEF DESCRIPTION OF DRAWINGS

[0011] The above objective and advantages of the present invention will become more apparent by describing in detail a preferred embodiment thereof with reference to the attached drawings in which:

[0012] FIG. 1 is a diagram showing the processing sequence of a method for manufacturing pure salt according to the present invention.
MODES FOR CARRYING OUT THE INVENTION

[0013] Hereinbelow, preferred embodiments of the present invention will be described.

[0014] Solar salt is placed in a heating kiln and heated at a temperature of approximately 200°C. for about 1 hour to dry moisture contained in the solar salt. The dried salt is again placed in the heating kiln and heated at 1300°C to be liquefied for primary melting. The molten salt is diluted with clean water to sediment heavy metals or impurities contained in the salt. Only brine is separated from the resulting material and heated to evaporate moisture, thereby producing crystallized salt.

[0015] The crystallized salt is placed in the heating kiln and heated at 1500°C for secondary melting. The secondarily molten salt is diluted with clean water to secondarily sediment heavy metals or impurities contained in the salt, and only brine is separated, therefrom to produce crystallized salt.

[0016] The crystallized salt is placed in the heating kiln and heated at 1800°C for third melting. The thirdly molten salt is diluted with clean water to sediment impurities, and only brine is separated therefrom to produce crystallized salt.

[0017] Then, the crystallized salt is placed in the heating kiln and heated at 2000°C for fourth melting, and then an upper layered portion of the molten salt is separated from a lower layered portion to coagulate the separated molten salt. The coagulated salt is pulverized to produce powdered salt.

[0018] Now, another embodiment of the present invention will be described.

[0019] Solar salt is placed in a heating kiln, heated at 1200°C, melted and then sterilized. The molten salt is heated at 1500°C to burn impurities floating in the upper layered portion of the molten solution to be removed. Only one third the remaining molten salt is separated. The procedure is repeated three times to extract pure salt. The extracted salt is coagulated and then pulverized to produce powdered salt.

[0020] As described above, according to the method for manufacturing pure salt of the present invention, melting, sedimentation and separation are repeated several times, thereby completely removing various heavy metals and impurities contained in solar salt to thus obtain harmless salt. Also, a large amount of salt can be produced at once, thereby improving the productivity.

Industrial Applicability

[0021] In the salt manufacturing method according to the present invention, pure salt can be produced by processing solar salt to effectively remove heavy metals or other impurities contained in the solar salt. The thus-produced salt can be used as not only food grade salt but also as additives for medical or pharmaceutical products for rinsing eyes and treating or preventing oral diseases. Also, the salt per se can be used for removing visceral waste matter or massaging skin.

What is claimed is:

1. A method for manufacturing pure salt, including the steps of:
   - placing solar salt in a heating kiln and heating the same at 200°C to dry moisture contained in the solar salt;
   - placing the dried salt in the heating kiln and heating the same at 1300°C to be liquefied for primary melting;
   - diluting the molten salt with clean water to sediment heavy metals or impurities contained in the salt;
   - separating only brine from the resulting material and heating the same to evaporate moisture contained in the brine;
   - heating moisture-evaporated salt to produce crystallized salt;
   - placing the crystallized salt in the heating kiln and heating the same at 1500°C for secondary melting;
   - diluting the secondarily molten salt with clean water to secondarily sediment heavy metals or impurities contained therein;
   - separating unsedimented brine and heating the same to produce crystallized salt;
   - placing the crystallized salt in the heating kiln and heating the same at 1800°C for third melting;
   - diluting the thirdly molten salt with clean water to sediment impurities contained therein;
   - separating unsedimented brine and heating the same to produce crystallized salt;
   - placing the crystallized salt in the heating kiln and heating the same at 2000°C for fourth melting;
   - separating an upper layered portion of the molten salt from a lower layered portion;
   - coagulating the separated molten salt; and
   - pulverizing the coagulated salt to produce powdered salt.

2. A method for manufacturing pure salt, including the steps of:
   - placing solar salt in a heating kiln, heating the same at 1200°C to be melted and then sterilizing the molten salt;
   - heating the molten salt at 1500°C to burn impurities floating in the upper layered portion of the molten solution to be removed;
   - separating only one third the remaining molten salt and repeating the above procedure several times to extract pure salt; and
   - coagulating the extracted salt and then pulverizing to produce powdered salt.

* * * * *