

THE MAGNETIZATION AND PURIFICATION OF DRINKING WATER BY SPECIAL PURPLE SAND MATERIALS UNDER DIFFERENT FIRING TEMPERATURE

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This study based on the special violet arenaceous function of magnetization, the production of a new type of magnetized water quality ceramic material existing purple fire craft and the operation is difficult with low yield, analyzes the influence in the process of violet arenaceous violet arenaceous technology key conditions and affecting factors, to improve product quality, reduce the production cost to improve the production process flow and modulation formula, the new material for the production which has the function of magnetized water quality ceramic products has a high reference value, can provide drinking water purification and medical water purification field with new material selection.

Key words: new type of purple sand material; magnetized water; water purification; medical water; firing temperature

1. Introduction

Special purple sand is produced by kiln, firing temperature higher than ordinary violet arenaceous, up to 1300°C, only a few are recommended not only beautiful, and after tea, the tea does not corrupt in the pot for the night, use for a long time, even pour boiled water, also can have special purple sand tea color, flavor and in addition to the function and the function of magnetized water, special violet arenaceous material containing ferric oxide, ferric oxide via a certain temperature of fire into ferrous oxide, and have certain magnetic properties and corrosion resistance, in the magnetic environment, bacteria will be negative number, can reduce the bacteria breeding and magnetized water penetration dissolved force is very strong, use magnetized water to make tea, tea of nutrition will be a large amount of precipitation, the longer the precipitates, the more scientific research shows that the magnetized water for cell absorption rate, up to 30 times mineral water absorption rate, magnetized water can help promote biological neural tissue metabolism, can promote cell biological activity, this is the opposite of tap water[1,3,5]. After magnetization treatment of natural water of tap water, the microbial content in water can be reduced by 81% to 97%. Use magnetized water to clean the wound, have the effect of sterilization, the wound healing quickly[2,4].

Special purple fire traditional way is to use a special kind of purple sand slurry material is fired, but clay material formula and firing technology has lost years, only to see several his works in the museum of modern methods of fire usually by wu baked black ash technology, or through synthetic sludge fired, namely manganese iron is added in the sludge metal oxide as colouring agent, such as synthetic material calcined products easy exhalation toxic mud is not easy to use for a long time, so the

use of natural clay preparation new mud compound has certain advantages, for one, is a natural mineral ingredients, no added toxic chemicals, safety performance;[6,7,8]

Secondly, the clay can be burned at high temperature, and it will not produce sintering phenomenon due to improper firing method. The clay is flexible, and the finished product is beautiful, which increases the aesthetic value of the product.

2. Methodology

Due to special violet arenaceous raw material is difficult to obtain, fire system is difficult to control, so the use common clay to replace the special purple fire products are able to increase the quantity of fungicide were adsorption toxic substances in the solution in the sterilization of the reason is that its finished product ferrous oxide and ferric oxide is made up of ferric oxide in the material transformation, it is also known as black iron Magnet for magnets, the substances dissolved in acid solution Insoluble in water and alkali solution.

Been scientifically tested shows special purple fire product contains 6.6% ferrous oxide, the content of ferric oxide is key to the success of new ceramic material preparation The chemical formula which best characterizes the known both under the condition of heating:



Therefore, the ratio of trioxide in the new ceramic materials is calculated, and the generation X g trioxide is required to consume Y g trioxide, which is obtained by the law of conservation of mass:

$$Y = X + \frac{X}{29} \quad (2)$$

X = 6.6, known solutions of Y = 6.828, so the preparation of new ceramic materials must join 6.828% ferric oxide Clay weighing in ferric oxide powder and use vacuum pug mill of refining, fire experiments Fire, after the completion of the products to a functional test.

Table 1 The composition of the special purple sand

Component name	scale	percentage(%)
Red kaolin		20
White kaolin		20
bian-stone powder		10
tuogou clay/Native clay		30
feldspar		15
quartz		5

Table2 The results of chemical composition analysis and its proportion in the special purple sand

Chemical weight name	The proportion of each chemical composition in the special purple sand (%)	Specific gravity of chemical components of the special purple sand in new needle stone ceramic materials(%)
CaCO ₃	96.16	9.616
MgO	0.59	0.059
SrO	0.33	0.033
Fe ₂ O ₃	0.37	0.037
SiO ₂	0.79	0.079
TiO ₂	0.40	0.04
Na ₂ O	0.84	0.084
K ₂ O	0.05	0.005

3. Results and discussion

Although Fe₂O₃ is transformed into Fe₃O₄ when heated, it is converted to FeO in a reductive atmosphere, because the kiln is in a closed state. When the fuel consumes the oxygen in the furnace, will absorb oxygen from the fetus, CO will absorb the oxygen in the Fe₂O₃ to produce FeO.

Therefore, the kiln atmosphere should be strictly controlled and the oxidation atmosphere should be maintained when firing new ceramic materials.

3.1. Effect of heating curve on PH value in water:

Instrument:PH-meter; measuring range 0-14PH; Model: MT-5000;

The experimental condition variable for heating is: 20°C, 40°C, 60°C, 80°C and 100°C.

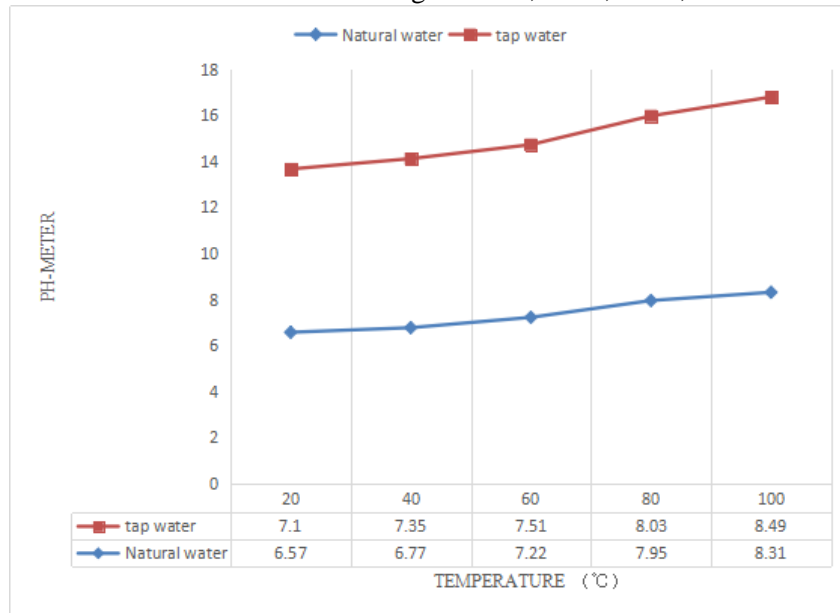


Figure. 1 Heating curve and PH value.

3.2. Effect of heating curve on yield of finished products

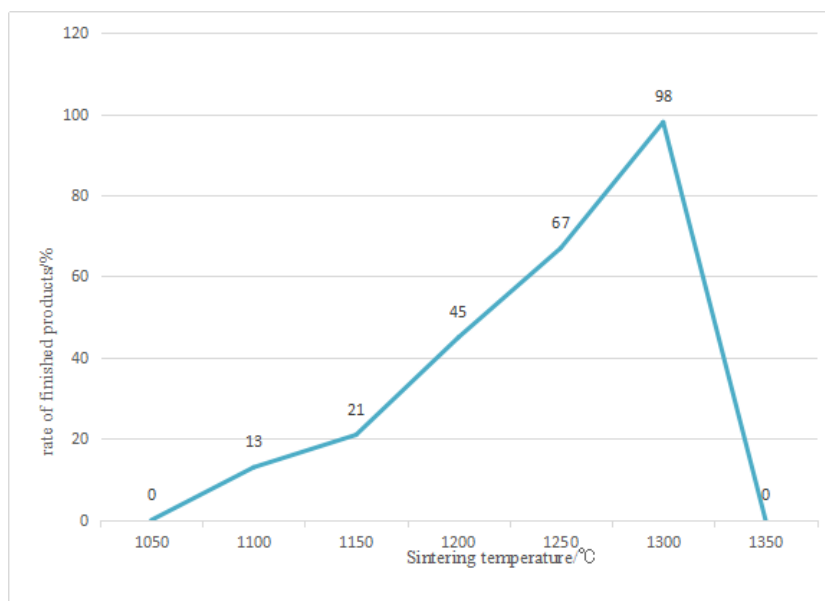


Figure. 2 The relationship between the temperature of the kiln and the rate of finished products.

3.3 Effect of Using Magnetic Water Tea on the Number of Heterotrophs in Water

3.3.1 Culture medium

Culture medium composition and culture environment shown in table.2.

Table.3 Culture medium composition and culture environment

name	ingredient	Culture temperature/°C	incubation time /d
Culture medium	Beef extract, AGAR, peptone, NaCl	38	7

3.3.2 Water samples: New type of ceramic material sample water(a) Ordinary glass container bubble sample water(b)

Figure. 3 Effect of magnetized water on the number of heterotrophic bacteria.

3.4 The precipitation of tea polyphenols in different containers

Raw material: 4 g tea samples, green tea, 200mL second distilled water

The water temperature: 100 °C

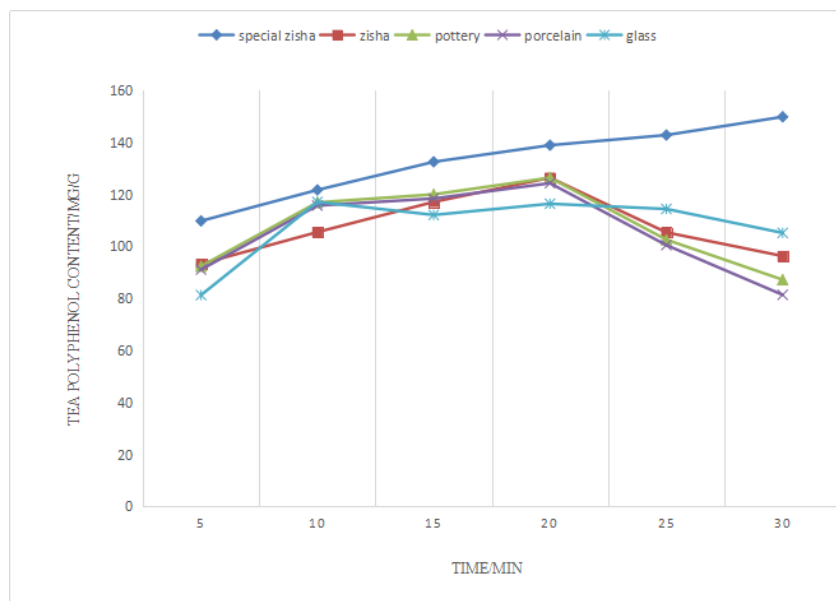


Figure. 4 Precipitation of tea polyphenols in different containers.

3.5 Drinking the health of the volunteers by the special purple sand

Experimental materials: 20g special purple sand, volume 200mL

Table 4 Drinking the health of the volunteers by the special purple sand group I

time element	40°C	60°C	80°C	100°C
Ca	2.0785	3.9874	4.2861	5.1828
Fe	0.0022	0.0034	0.0045	0.0109
K	0.0340	0.0560	0.0980	0.1209
Mg	0.0320	0.0487	0.0890	0.1009
Na	0.0599	0.1040	0.1115	0.2056
Si	0.1101	0.1231	0.1475	0.1634
Sr	0.0087	0.0176	0.0346	0.0399
Ti	D.L.	————	————	————

Table 5 Drinking the health of the volunteers by the special purple sand group II

time element	40°C	60°C	80°C	100°C
Ca	2.2877	3.4556	4.4590	5.3928

Fe	0.0053	0.0060	0.0090	0.0288
K	0.0644	0.0792	0.1452	0.1678
Mg	0.0544	0.0782	0.0885	0.1202
Na	0.0728	0.1320	0.1930	0.3288
Si	0.0130	0.1350	0.1305	0.1598
Sr	0.0091	0.0270	0.0376	0.0378
Ti	D.L.	————	————	————

Table 6 Drinking the health of the volunteers by the special purple sand group III

time element	40°C	60°C	80°C	100°C
Ca	3.2357	4.4553	5.4501	5.3944
Fe	0.0046	0.0058	0.0088	0.0256
K	0.0635	0.0777	0.1050	0.1188
Mg	0.0644	0.0792	0.1452	0.1678
Na	0.0226	0.0367	0.0898	0.1277
Si	0.0745	0.1355	0.1917	0.3287
Sr	0.0130	0.1350	0.1305	0.1598
Ti	D.L.	————	————	————

Table 7 Drinking the health of the volunteers by the special purple sand group IV

time element	40°C	60°C	80°C	100°C
Ca	3.2645	4.4542	5.4503	5.3944
Fe	0.0040	0.0077	0.0089	0.0256
K	0.0630	0.0771	0.1002	0.1179

Mg	0.0544	0.0782	0.0885	0.1202
Na	0.0728	0.1320	0.1930	0.3288
Si	0.0145	0.1388	0.1367	0.1512
Sr	0.0085	0.0201	0.0345	0.0353
Ti	D.L.	————	————	————

Table 8 Drinking the health of the volunteers by the special purple sand group V

time element	40°C	60°C	80°C	100°C
Ca	3.2833	4.4583	5.4570	5.3990
Fe	0.0045	0.0038	0.0077	0.0291
K	0.0689	0.0756	0.1081	0.1182
Mg	0.0592	0.0728	0.0892	0.1290
Na	0.0793	0.1337	0.1919	0.3203
Si	0.0140	0.1336	0.1330	0.1591
Sr	0.0055	0.0266	0.0323	0.0389
Ti	D.L.	————	————	————

Table 9 Drinking the health of the volunteers by the special purple sand VI

time element	40°C	60°C	80°C	100°C
Ca	3.2863	4.4590	5.4583	5.3946
Fe	0.0088	0.0077	0.0020	0.0202
K	0.0692	0.0783	0.1040	0.1129
Mg	0.0503	0.0767	0.0892	0.1230
Na	0.0702	0.1382	0.1930	0.3240

Si	0.0190	0.1319	0.1348	0.1572
Sr	0.0073	0.0203	0.0355	0.0329
Ti	D.L.	—————	—————	—————

4 Conclusion

According to the analysis of experimental data, natural water and tap water are used to soak water through new ceramic materials, respectively. Among them, the tap water has a higher PH value because tap water purified by itself is weakly alkaline. The standard pH value of ordinary tap water is between 6.5-8.5, but the actual measurement of household water is only about 7.1-7.2.

It can be seen from the experimental data that the PH of the soaking water using the new ceramic material is obviously improved. Through the observation of the heating curve and yield, it was found that the optimal firing temperature was between 1280-1300°C.

In Experiment 3, comparing the amount of heterotrophic bacteria in new ceramic materials and ordinary glassware, it was found that the content of heterotrophic bacteria in ordinary glassware was 2.1-9.5 times more than that of new ceramic materials. It can be seen that the new material can inhibit the growth of heterotrophic bacteria, keep the water fresh.

In experiment 4, the tea polyphenol content of five kinds of different materials was observed. It was found that the content of tea polyphenols in the tea water brewed by the new ceramic material was very high compared with other utensils, and tea polyphenols in other utensils were also found in other utensils.

The amount of precipitation gradually decreases after a certain brew time, and the content of tea polyphenols in the new material is proportional to the time.

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