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METHOD OF PRODUCING AN ARTICLE IMPREGNATED WITH SYNTHETIC RESIN

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This invention relates to an improved method of preparing a material which does not absorb water, and which is compact and strong, by impregnating a porous basal body with synthetic reaction.

For a basal body, which is to be impregnated with synthetic resin, either a fired earthenware or a fibrous, porous, mouldable product is employed. The fired earthenware is made from clay containing aluminium silicate as the chief component, or to which is added dolomite powder, feldspar powder, or some other such potter's clay, which is moulded into a desired form and fired until the clay reaches the point of vitrification. The fibrous, porous, mouldable product is made by mixing a fibrous matter like asbestos, or rock fiber, with cement mortar, or gibses, or clay, and then hardening it in the forms desired.

The synthetic resin for impregnating the basal body is in the early state of condensation or polymerisation, that is the condensation or polymerisation reaction being increased very slightly, and which is in the form of a solution. After the basal body has been impregnated with this resin in liquid form, heat treatment is employed, by which the condensation or polymerisation reaction is carried out and the impregnated resin is hardened by completing the synthetic reaction.

The object of this invention is to produce non-water absorbing articles which excel in resisting corrosive elements, in insulating electricity and in strongness.

In order that the said invention may be clearly understood, the same will now be described more fully by way of the following examples:

Example I.—Take 60 to 75 parts of clay, containing aluminium silicate as the chief component, mix with 20 to 30 parts of dolomite powder and 5 to 6 parts of feldspar powder. These are kneaded together. The mixed earthenware material described above is moulded into the required form and dried. This is inserted into a kiln, or a furnace, and fired until it begins slightly to vitrify (commonly vitrification starts at a temperature of 1150° C.).

In this way a biscuit is prepared which is niserted into a closed vessel, from which the air has been extracted under a temperature of about 80° C. When the gases in the pores of the biscuit have been extracted, the vessel is filled with the early condensation product of phenol and formaldehyde, which has not reached what is called the A state, so it shows a condition of solution, viz. a molecular state. The pressure in the closed vessel is increased and the pin-hole pores of the biscuit are completely impregnated with the condensation solution described above.

Drain the surplus condensation solution from the closed vessel and dry the impregnated biscuit. Then put the treated biscuit in a heating box, applying a pressure of about 200 lbs. per square inch, holding this pressure of about 200 lbs. a short time under a temperature of 180° C. This increases the condensation reaction of the solution and hardens it. The biscuit produced by this method absorbs liquid much more readily than does commonly prepared porcelain, therefore, when impregnating it with synthetic resin, the condensation solution can easily and in high density be suffused deep into the body. Moreover, since the early state of the condensation solution has a high osmotic character, the above impregnation becomes all the more thorough.

Besides, when the impregnating operation begins, the biscuit is first heated and the gas involved in its pores is fully extracted, making an excellent state for thorough impregnation is with the resin solution. Therefore, the impregnation is all the more easily accomplished deep into the biscuit at a high density.

A product made by this process has high excellence, characterised by not absorbing water and being much stronger and acid-resisting than the substance prepared by impregnating an ordinary base of porcelain or earthenware with a resin solution.

Example II.—Take 70 parts of clay, of which the chief component is aluminium silicate, mixed with 30 parts of asbestos powder. Knead them with a diluted water solution of sodium silicate. After this has been moulded to the required form and dried, subject it to a temperature below 300° C. The substance thus prepared may be employed as a basal body, into which the synthetic resinous condensation product in its early state as mentioned in Example I is impregnated through the same method as in the case of Example I. The impregnated solution is then hardened, by heating.

This method has many advantages. The operation is simple and there is no danger of deforming or causing cracks in the basal body since high temperature is not required to make the basal body.

An article can be obtained which is by no means inferior to products using as basal body fired earthenware produced by high temperature, in the point of not absorbing water, resist-

ing corrosives, and having strength and hardness.

Example III.—Mix 12 parts of asbestos powder with mortar prepared by adding 7 parts of water to 3 parts of Portland cement. When thoroughly mixed, insert the substance in a mould and press the excess cement mortar from the cement mat. After the cement mat has coagulated in the mould, remove and dry it.

In this manner, asbestos fibres can be fixed in any form desired by employing cement. The base prepared in this manner is filled with minute pin-hole like pores. This is impregnated with the synthetic resin solution as in Example I and subjected to hardening treatment to obtain the product desired.

Example IV.—Furthermore, by heating the articles prepared by the methods described in Example I to a temperature of about 400° C. Until the impregnated synthetic resin is carbonized or semi-carbonized, and then again impregnating it with fresh synthetic resin solution and hardened as described before. Articles obtained in this manner have a high resistance against corrosives and are suitable to use as pans to use for high temperature reactions.

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