Where one or several impregnations with an oxide producing material has been made and appropriately cured, further impregnations and cures with the oxide producing materials will usually result in further accumulation of the oxide; however, once the phosphoric acid is impregnated into the refractory base material and cured, the base material will not materially be enhanced by any further oxide additions. This would appear to indicate a completion of a chemical reaction between the refractory base oxide and the phosphoric acid on being cured to produce the unidentified reaction product having *d* plane spacing of 4.12 angstroms.

It has further been found that the higher the purity of the porous refractory oxide base material, the harder the treated and cured product. Using as a starting material Coors AP–99–L3 which contains 99% aluminum oxide, it is possible to produce a hardness of Rockwell A–90 with the treating process of this invention. The base material can be treated with either phosphoric acid or a salt convertible to an oxide or both. The phosphoric acid appears to react with the base or skeletal oxide and possibly with the added oxide as well. While phosphoric acid is to be preferred from the point of ease of use, other materials may be used as the source of the phosphate ion which are capable of releasing same such as sodium phosphate and sodium triphosphate in solution.

While there have been described what at present are considered to be the preferred embodiments of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention. It is aimed, therefore, in the appended claims to cover all such changes and modifications which fall within the true spirit and scope of the invention.

We claim:

1. The method of producing a chemically hardened refractory ceramic body which comprises providing a core of a porous underfired partially vitrified machinable refractory ceramic oxide, substantially completely impregnating said core with a solution of a soluble chromium compound which compound is capable of being converted to an oxide on heating to a temperature below the vitrification temperature of the ceramic oxide and curing said impregnated core by raising the temperature thereof to at least 600° F. but less than the vitrification temperature of the ceramic oxide over a period of time sufficient to convert the compound impregnated therein to an oxide to harden the ceramic.

2. The method of claim **1** wherein the solution is chromic acid.

3. The method of claim **1** wherein the solution is of magnesium chromate.

4. A chemically hardened underfired partially vitrified refractory ceramic oxide body having a skeletal core of refractory oxide, said core having an unfilled effective porosity of at least from about 13% to about 46% with said pores of said skeletal core having substantial deposits within its interstices throughout the body of a chromium oxide.

5. The ceramic body of claim **4** wherein the refractory oxide body consists of refractory ceramic oxide selected from the group consisting of the oxides of aluminum, barium, beryllium, calcium, cerium, chromium, cobalt, gallium, hafnium, lanthanum, magnesium, manganese, nickel, niobium, tantalum, thorium, tin, titanium, uranium, vanadium, yttrium, zinc, zirconium and mixtures thereof.

6. The ceramic body of claim **4** wherein the refractory oxide body is selected from the group consisting of the oxides of aluminum, beryllium, magnesium, titanium, zirconium and mixtures thereof.

7. The ceramic body of claim **4** wherein the skeletal core is of at least about 85% aluminum oxide.

8. The ceramic body of claim **4** wherein the skeletal core is of at least about 96% beryllium oxide.

9. The ceramic body of claim **4** wherein the skeletal core is of at least about 89% magnesium oxide.

10. The ceramic body of claim **4** wherein the skeletal cores is of at least about 95% zirconium oxide.

11. The ceramic body of claim **4** wherein the skeletal core is of at least about 98% titanium dioxide.

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RALPH S. KENDALL, Primary Examiner

U.S. Cl. X.R.

106—66, 57, 59; 117—169