zation of 410 Gauss/cm^3, a remnance of 877 Gauss/cm^3, an initial permeability of 0.11 and a maximum permeability of 0.29.

A sintering temperature of 1300° C. for 3 hours produced a product having a density of 5.16 g./cm^3, a saturation magnetization of 407 Gauss/cm^3, a remnance of 461 Gauss/cm^3, an initial permeability of 0.11 and a maximum permeability of 0.29.

EXAMPLE 26

A solution containing 22.0 g. (0.1 mole) of zinc acetate dihydrate in 250 ml. of distilled water and a solution containing 96.4 g. (0.2 mole) of ferric ammonium sulfate in 1 liter of distilled water were combined with stirring and brought to pH 7 by addition of concentrated aqueous ammonia. The resulting gelatinous suspension was stirred 1 hr. at room temperature and then centrifuged 10 minutes at 2000 rpm. The supernatant was decanted and the residue was resuspended in distilled water and again centrifuged 10 minutes at 2000 rpm. After decanting the supernatant the residue was suspended in water and the product collected by filtration. The filter cake was allowed to dry at room temperature and then heated 1 hour at 1100° C. to give a polycrystalline essentially non-porous zinc ferrite ceramic as indicated by X-ray diffraction and electron microscopy.

It is contemplated that by following a procedure similar to those described hereinabove but employing appropriate amounts of a water-soluble barium salt, a water-soluble titanium (IV) salt, ammonium carbonate and ammonium hydroxide, there will be produced a polycrystalline barium titanate ceramic.

I claim.

1. As an article of manufacture, substantially pure hydroxylapatite in the form of a translucent, isotropic, polycrystalline, sintered ceramic having an average crystallite size in the approximate range 0.2 to 3 microns, a density greater than approximately 98 percent of the theoretical density of hydroxylapatite and being further characterized by the absence of pores and by cleavage along smooth curved planes.

2. An article of manufacture according to claim **1** having a pH of 10–12.

3. An article of manufacture according to claim **1** wherein there is incorporated in said article an amount of fluoride ion effective in substantially reducing the rate of decomposition of said article by lactic acid.

4. An article of manufacture according to claim **1** shaped or formed substantially into a flat sheet.

5. A strong, dense, artificial bone or tooth prosthesis in the form of a polycrystalline ceramic according to claim **1**.

6. As an article of manufacture, a strong, hard, dense, isotropic, polycrystalline sintered biphasic ceramic comprising as one phase from about 20 to 95 percent by weight of hydroxylapatite and as a second phase from about 5 to 80 percent by weight of whitlockite and being characterized by the absence of pores and by cleavage along smooth curved planes.

7. An article of manufacture according to claim **6** wherein there is incorporated in said article an amount of fluoride ion effective in substantially reducing the rate of decomposition of said article by lactic acid.

8. An article of manufacture according to claim **6** shaped or formed substantially into a flat sheet.

9. A strong, dense, artificial bone or tooth prosthesis in the form of a polycrystalline ceramic according to claim **6**.

10. The process which comprises reacting calcium ion with phosphate ion in aqueous medium at a pH of about 10–12 to produce a gelatinous precipitate of a phosphate of calcium having a molar ratio of calcium to phosphorus between the approximate molar ratio of calcium to phosphorus in whitlockite and that in hydroxylapatite, separating said gelatinous precipitate from solution, heating said gelatinous precipitate up to a temperature of at least approximately 1000° C. but below that at which appreciable decomposition of hydroxylapatite occurs, and maintaining said temperature for sufficient time to effect the sintering and substantially maximum densification of the resulting product.

11. A process according to claim **10** which comprises the steps of reacting calcium ion with phosphate ion in aqueous medium at a pH of about 10–12 to produce a gelatinous precipitate of hydroxylapatite, having a molar ratio of calcium to phosphorus of about 1.67, separating said gelatinous precipitate from the solution, heating said gelatinous precipitate up to a temperature in the approximate range 1000° C. to 1250° C. and maintaining said temperature for approximately 20 minutes to 3 hours.

12. A process according to claim **11** wherein said calcium ion is provided by calcium nitrate and said phosphate ion is provided by diammonium hydrogen phosphate.

13. A process according to claim **12** wherein said temperature is maintained at approximately 1100° C. to 1200° C. for approximately 0.5 to 1 hour.

14. A process according to claim **13** wherein said temperature is maintained at 1100° C. for 1 hour.

15. A process according to claim **11** wherein up to about 3 molar percent additional calcium ion is added to said precipitate of hydroxylapatite.

16. A process according to claim **11** wherein about 0.4 to 0.6 percent by weight of an organic binder is added to said precipitate of hydroxylapatite, said organic binder being volatilized during said heating process.

17. A process according to claim **16** wherein said organic binder is collagen.

18. A process according to claim **11** wherein about 5 to 25 percent by weight of an organic binder is added to said precipitate of hydroxylapatite, said organic binder being volatilized during said heating process and thereby resulting in production of a porous form of the ceramic article.

19. A process according to claim **18** wherein said organic binder is powdered cellulose, cotton, or collagen.

20. A process according to claim **11** wherein about 0.01 to 1 percent by weight of fluoride ion is added to said precipitate of hydroxylapatite.

21. A process according to claim **11** wherein the article produced thereby is allowed to stand in about 0.5 to 5 percent aqueous sodium fluoride for about 12 hours to five days.

22. A process according to claim **10** which comprises the steps of reacting calcium ion with phosphate ion in aqueous medium at a pH of about 10–12 to produce a gelatinous precipitate of calcium phosphate having a molar ratio of calcium to phosphorus substantially less than 1.67 but not less than about 1.50, separating said gelatinous precipitate from the solution, heating said gelatinous precipitate up to a temperature in the approximate range 1000° C. to 1350° C. and maintaining said temperature for approximately 20 minutes to 3 hours.