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[54] **PRE-CERAMIC POLYMERS IN FABRICATION OF CERAMIC COMPOSITES**

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[73] Assignee: **The United States of America**, as represented by the Secretary of Commerce, Washington, D.C.

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[58] Field of Search 501/32, 1, 127, 501/12, 134, 80, 153, 103, 154; 106/35; 424/422, 423; 433/222.1, 201.1, 212.1; 523/113, 115, 116; 428/306.6, 307.3; 427/376.2, 245, 2.26, 2.27, 2.29

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[57] **ABSTRACT**

Composites in the form of a three-dimensional framework or skeleton of ceramic particles are formed by a low cost, low temperature sintering process which decomposes a pre-ceramic inorganic or organic precursor. Upon heating, preferably in air, the precursor decomposes to form a ceramic phase in the form of necks between the individual ceramic particles. The properties of the resulting porous ceramic bodies can be modified, such as toughened by impregnation with monomers, oligomers or polymers which are polymerized or cured in situ. Such composites find use as cosmetic products or prostheses for humans and animals, such as dental restoratives and bone implants. Methods of fabrication are disclosed which include the use of a pre-ceramic polymer as a binder for the ceramic particles which forms the necks of material between the individual ceramic particles upon firing.

27 Claims, 1 Drawing Sheet

