

Title (en)
SINTERABLE NANOPOWDER CERAMIC MATERIAL AND METHOD FOR SYNTHESIS THEREOF

Title (de)
SINTERBARES NANOPULVER-KERAMIKMATERIAL UND SYNTHESEVERFAHREN DAFÜR

Title (fr)
NANOPOUDRE CERAMIQUE APTE AU FRITTAGE ET SON PROCEDE DE SYNTHESE

Publication
EP 1708975 A1 20061011 (FR)

Application
EP 05717497 A 20050127

Priority
• FR 2005000174 W 20050127
• FR 0400898 A 20040130

Abstract (en)
[origin: FR2865671A1] Production of directly sinterable multi-element nanopowders (I), containing silicon, carbon, nitrogen, oxygen and 1-3 metallic elements (preferably aluminum, yttrium, magnesium, ytterbium and/or lanthanum), involves generating an aerosol comprising precursor metal compound(s) (II) and hexamethyl disilazane (as main silicon source and sole solvent for (II)); adding silane or its precursor in gaseous form; and pyrolyzing the obtained reaction mixture using a laser. Production of directly sinterable multi-element nanopowders of formula $\text{Si/C/N/E aE' b/E'' c/O}$ (I) involves: (1) forming an aerosol comprising at least one precursor metal compound (II) containing at least one E, E' and E'' and hexamethyl disilazane (as main silicon source and sole solvent for (II)), using an aerosol generator; (2) adding silane (SiH_4) or its precursor, in gaseous form; and (3) pyrolyzing the obtained reaction mixture using a laser. E, E', E'' : three different metallic elements; a, b, c : numbers, at least one of which is other than zero. Independent claims are included for: (1) the nanopowders (I) obtained by the process; (2) the production of a ceramic composite (A), by preparing (I) as described above then sintering; and (3) new ceramic composites (A') of the silicon nitride-silicon carbide ($\text{Si}_3\text{N}_4/\text{SiC}$) type, obtained by the above process and having a particle size of less than 100 nm (and preferably a density of 100% of the theoretical value).

IPC 8 full level
C04B 35/565 (2006.01); **C01B 21/082** (2006.01); **C04B 35/584** (2006.01); **C04B 35/64** (2006.01); **C04B 35/645** (2006.01)

CPC (source: EP US)
B82Y 30/00 (2013.01 - EP US); **C01B 21/0828** (2013.01 - EP US); **C04B 35/584** (2013.01 - EP US); **C04B 35/62655** (2013.01 - EP US); **C04B 35/6267** (2013.01 - EP US); **C04B 35/64** (2013.01 - EP US); **C04B 35/6455** (2013.01 - EP US); **C01P 2002/85** (2013.01 - EP US); **C01P 2004/64** (2013.01 - EP US); **C04B 2235/3206** (2013.01 - EP US); **C04B 2235/3217** (2013.01 - EP US); **C04B 2235/3224** (2013.01 - EP US); **C04B 2235/3225** (2013.01 - EP US); **C04B 2235/3227** (2013.01 - EP US); **C04B 2235/3418** (2013.01 - EP US); **C04B 2235/441** (2013.01 - EP US); **C04B 2235/46** (2013.01 - EP US); **C04B 2235/465** (2013.01 - EP US); **C04B 2235/5454** (2013.01 - EP US); **C04B 2235/666** (2013.01 - EP US); **C04B 2235/668** (2013.01 - EP US); **C04B 2235/77** (2013.01 - EP US); **C04B 2235/781** (2013.01 - EP US)

Citation (search report)
See references of WO 2005082808A1

Designated contracting state (EPC)
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR

DOCDB simple family (publication)
FR 2865671 A1 20050805; **FR 2865671 B1 20070316**; EP 1708975 A1 20061011; JP 2007522063 A 20070809; JP 4833082 B2 20111207; US 2007232479 A1 20071004; US 7687421 B2 20100330; WO 2005082808 A1 20050909

DOCDB simple family (application)
FR 0400898 A 20040130; EP 05717497 A 20050127; FR 2005000174 W 20050127; JP 2006550244 A 20050127; US 58790505 A 20050127