~~Claims~~ Claims

~~1. An aqueous suspension comprising at least one metal carbide particle and at least one dispersant, wherein the proportion of the at least one metal carbide particle is in the range from 30% to 95% by weight based on the total weight of the suspension.~~

~~2. The aqueous suspension as claimed in claim 1, characterized in that~~
~~the at least one metal carbide particle is selected from the group consisting of carbides of titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, silicon, and mixtures thereof, with preference given to tantalum carbide; and~~
~~wherein the at least one metal carbide particle has an average particle size preferably in the range from 0.05 to 25 µm, more preferably from 0.5 to 5 µm, and particularly preferably from 1 to 2 µm, and/or~~
~~the at least one metal carbide particle has a content of individual elemental impurities preferably of < 300 ppm, more preferably < 10 ppm, and particularly preferably of < 1 ppm; and/or~~
~~the dispersant is selected from the group consisting of polyacrylic acid, which preferably has a number-average molecular weight in the range from 3000 to 10 000 g/mol and more preferably from 4000 to 6000 g/mol, tetrabutylammonium hydroxide, and mixtures thereof.~~

~~3. The aqueous suspension as claimed in claim 1 or 2, characterized in that~~
~~this comprises at least one additive selected from the group consisting of bases, in particular sodium hydroxide solution, defoamers, in particular fatty alcohol polyalkylene glycol ethers, sintering aids, in particular cobalt or silicon, and mixtures thereof.~~

~~4. The aqueous suspension as claimed in any of the preceding claims, characterized in that~~

~~the proportion of metal carbide particles is in the range from 40% to 90% by weight and preferably from 60% to 85% by weight, based on the total weight of the suspension; and/or~~

~~the proportion of the dispersant is in the range from 0.05% to 5% by weight and preferably from 0.1% to 2% by weight, based on the total weight of the suspension; and/or~~

~~the proportion of the at least one additive is in the range from 0% to 10% by weight and preferably from 0.5% to 5% by weight, based on the total weight of the suspension.~~

~~5. A process for coating a substrate comprising the following steps:~~

~~i) providing a substrate;~~

~~ii) providing an aqueous suspension as claimed in any of claims 1 to 4;~~

~~iii) applying the suspension from step ii) to the surface of the substrate from step i);~~

~~iv) drying the applied suspension, resulting in the formation of a coating on the surface of the substrate.~~

~~6. The process as claimed in claim 5, characterized in that~~

~~the substrate is selected from the group consisting of graphite, materials having an adjusted coefficient of thermal expansion, preferably graphite having an adjusted coefficient of thermal expansion in the range from 6.5 to 7.5 * 10^{-6} K^{-1}, and mixtures thereof.~~

~~7. The process as claimed in either of claims 5 or 6, characterized in that~~

~~the process includes the following further steps:~~

~~v) pretreating the substrate provided in step i) prior to step iii), with the pretreatment effected preferably by a measure selected from the group consisting of mechanical roughening of the surface, thermal pretreatment of the surface, chemical treatment of the surface, and mixtures thereof, and subsequent cleaning, in particular by means of sonication;~~

~~vi) sintering of the coating obtained after step iv).~~

~~8. The process as claimed in any of claims 5 to 7, characterized in that~~

~~the suspension in step iii) is applied by painting, dipping or spraying.~~

~~9. The process as claimed in any of claims 5 to 8, characterized in that~~

~~step iv) is carried out at a temperature in the range from 100 to 600°C, preferably from 120 to 550°C, and more preferably from 145 to 455°C, with preference given to carrying out step iv) over a period of 5 to 40 hours and more preferably of 20 to 30 hours, particular preference being given to a drying process iv) in which the temperature is increased in stages, with the following temperature ranges and time intervals most preferred:~~

~~(1) 140 to 160°C for 2.5 to 3.5 hours; then~~

~~(2) 180 to 220°C for 1.5 to 2.5 hours; then~~

~~(3) held for 2 hours at the temperature from (2); then~~

~~(4) 200 to 250°C for 1.5 to 2.5 hours; then~~

~~(5) 310 to 350°C for 4.5 to 5.5 hours; then~~

~~(6) 330 to 350°C for 1.5 to 2.5 hours; then~~

~~(7) held for 2 hours at the temperature from (6); then~~

~~(8) 380 to 420°C for 3.5 to 4.5 hours; then~~

~~(9) 430 to 470°C for 1.5 to 2.5 hours;~~

~~and/or~~

~~step vi) is carried out at a temperature in the range from 2000 to 2600°C, preferably from 2100 to 2500°C, and more preferably from 2200 to 2300°C, with preference given to carrying out step vi) over a period of 1 to 10 hours and more preferably of 3 to 5 hours; and/or~~

~~step vi) is carried out at a pressure in the range from 500 to 900 torr, preferably from 600 to 800 torr, and more preferably from 680 to 720 torr; and/or~~

~~step vi) is carried out under inert gas, with the inert gas preferably being selected from the group consisting of helium, argon, nitrogen, and mixtures thereof.~~

~~10. The process as claimed in any of claims 5 to 9, characterized in that~~

~~the green density of the coating after step iv) and/or prior to step vi) is at least 50% and preferably at least 60%; and/or~~

~~the coating after step iv) or vi) has an impurity content of less than 300 ppm and preferably of less than 1 ppm; and/or~~

~~the coating after step iv) or vi) has an open porosity of less than 5% and preferably of less than 1%.~~

~~11. The process as claimed in any of claims 5 to 10, characterized in that~~

~~the thickness of the coating after step iv) or vi) is in the range from 20 to 500 µm, preferably from 50 to 400 µm, and more preferably from 100 to 300 µm; and/or~~

~~the pH of the aqueous suspension prior to step iii) is in the range from 5 to 10 and preferably from 7 to 8, particularly for polyacrylic acid as dispersant.~~

~~12. A coated substrate producible by a process as claimed in any of claims 5 to 11.~~

~~13. The coated substrate as claimed in claim 12, characterized in that~~

~~the thickness of the coating is in the range from 20 to 500 µm, preferably from 50 to 400 µm, and more preferably from 100 to 300 µm.~~

~~14. The use of a coated substrate as claimed in either of claims 12 or 13 as a carbidic material.~~

~~15. The use as claimed in claim 14 in applications for crystal growing, in particular for applications in physical vapor phase processes, epitaxy processes, and for crucibles.~~

1. An invention not claimed in any divisional application.