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ABSTRACT

HIGHLY POLISHABLE, HIGHLY THERMALLY CONDUCTIVE,
SILICON CARBIDE, METHOD OF FORMATION
AND APPLICATIONS THEREOF

Silicon carbide is produced by chemical vapor deposition at temperatures from 1340-1380°C, deposition chamber pressures of 180-200 torr, H₂/methyltrichlorosilane ratio of 4-10 and deposition rate of 1-2 μm/min. Furthermore, H₂ supplied as a part of the gas stream contains less than about 1 part per million (ppm) O₂ gas, and various means are provided to exclude particulate material from the deposition chamber. The silicon carbide is polishable to <5 Å RMS as measured on a Talystep mechanical profiler and has a thermal conductivity of at least about 300 W/mk. The silicon carbide is particularly suitable for applications where high polishability and thermal conductivity is desired, such as hard disc drives and read/write heads of head disc assemblies, and also optical apparatus which require a very high polish. (FIG. 1)

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