

## Cr<sub>2</sub>AlC陶瓷的制备及性能

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收稿日期 2006-1-12 修回日期 2006-4-11 网络版发布日期 接受日期

**摘要** 以铬粉, 铝粉和石墨为原料, 采用热压方法制备Cr<sub>2</sub>AlC陶瓷材料. 研究了组成、烧结温度对试样物相和密度的影响. 研究表明, 当原始组分中Al过量低于20at%时, 样品中的主相为Cr<sub>2</sub>AlC, 另有微量的Cr<sub>7</sub>C<sub>3</sub>相. Al过量超过20at%时, 样品为Cr<sub>2</sub>AlC单相. 试样的块体密度随Al过量的增大而下降. Al过量10at%在1400 °C热压1h试样的室温硬度、弯曲强度和杨氏模量分别为3.5GPa, 375MPa和278GPa. 在75~269K温度区间, 样品的电导率随温度增加而线性地减少, 具有金属特性. 文中还报道了样品的热学性能.

**关键词** [Cr<sub>2</sub>AlC](#) [热压](#) [陶瓷](#) [电性能](#) [热导](#)

分类号 [TQ174](#)

## Fabrication and Properties of Cr<sub>2</sub>AlC Ceramics

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**Abstract** Cr<sub>2</sub>AlC ceramics were prepared by hot-pressing using Cr, Al and graphite powders as starting materials. The effects of composition and sintering temperature on the phase assembly and bulk density of the samples were studied. The results indicated that the phase assembly of the samples consisted of Cr<sub>2</sub>AlC, as a major crystalline phase, together with very small amount of Cr<sub>7</sub>C<sub>3</sub> for the composition with less than 20at% excessive Al content, whereas it became a single Cr<sub>2</sub>AlC phase in the sample for the composition with more than 20at% excess Al. The bulk density of the samples decreased with the increase in excess Al in the composition. The hardness, flexural strength and Young's modulus of the sample hot-pressed at 1400 °C for 1h for the composition Cr:Al:C=2:1.1:1 at room-temperature were 3.5GPa, 375MPa and 278GPa respectively. The electrical conductivity decreased linearly with the increase in temperature from 75K to 269K, which hinted that the electrical behavior of Cr<sub>2</sub>AlC likes that of metal. Its thermal properties were also determined.

**Key words** [Cr<sub>2</sub>AlC](#) [hot-pressed](#) [ceramic](#) [electric property](#) [thermal conduction](#)

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