

 论文摘要

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粉末注射成形热塑-热固粘结剂的脱脂工艺

祝宝军<sup>1</sup>, 曲选辉<sup>2</sup>, 陶颖<sup>3</sup>

( 1. 湖南大学 材料科学与工程学院, 长沙 410082;  
2. 北京科技大学 材料科学与工程学院, 北京 100083;  
3. 中南大学 材料科学与工程学院, 长沙 410083)

**摘要:** 研究了热塑-热固性粘结剂RG1-2的固化机理及固化动力学, 结果表明: 固化过程中发生了双氰胺中氨基与环氧基的加成反应、环氧基的醚化反应、氰基本身的反应及其与环氧基的反应。外推法得到固化起始温度 $t_i$ 、峰顶温度 $t_p$ 、峰终温度 $t_f$ 分别为157、177和206℃, 固化反应的活化能为112.5kJ/mol。根据固化动力学参数和粘结剂其它组元的性质, 制定了适宜的脱脂工艺制度。研究了脱脂工艺对粘结剂脱除量、脱脂坯强度、碳含量的影响。制备了力学性能优良、尺寸精度高的PIM硬质合金制品。

**关键词:** 粉末注射成形; 粘结剂; 硬质合金; 脱脂

**Thermo-debinding of thermoplastic-thermosetting binder  
for PIM process**

ZHU Bao-jun<sup>1</sup>, QU Xuan-hui<sup>2</sup>, TAO Ying<sup>3</sup>

( 1. School of Materials Science and Engineering,  
Hunan University, Changsha 410082, China;  
2. School of Materials Science and Engineering,  
University of Science and Technology Beijing,  
Beijing 100083, China;  
3. School of Materials Science and Engineering,  
Central South University, Changsha 410083, China)

**Abstract:** The mechanism and kinetics of the curing reaction of RG1-2 was studied. It was proved that the curing reaction include amido-epoxy reaction, etherisation of amido, polymerization of amido, etc. The curing parameters such as beginning temperature, top point temperature and finishing temperature of the DSC curve were determined by graph method as 157, 177 and 206℃, respectively. The activation energy  $E_a$  was calculated as 112.5kJ/mol. Temperature schedule of thermo-debinding process was formulated considering the curing parameters and properties of other binder components. Variation of binder loss ratio, strength and carbon content of the specimens during thermo-debinding process was examined, and cemented carbide with high mechanical properties and high dimension precision was made by PIM.

**Key words:** powder injection molding; binder; tungsten cemented carbide; debinding

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地址: 湖南省长沙市岳麓山中南大学内 邮编: 410083

电话: 0731-8876765, 8877197, 8830410 传真: 0731-8877197

电子邮箱: f-ysxb@mail.csu.edu.cn