

公示材料

项目名称：热防护复合材料的超高温氧化机理及防护涂层

提名者：中国科学院金属研究所

提名等级：中国腐蚀与防护学会科学技术奖，一等（自然）

主要完成人：张中伟，徐敬军，李美栓，左君，钱余海，高增华，任岩，张鑫涛

主要完成单位：中国科学院金属研究所，北京理工大学

主要知识产权目录如下：

序号	论文名称	年、卷、期、页	刊名
1	A novel ultra-high temperature oxidation technique in flowing gas with controlled oxygen partial pressure	(2010), 4(3), 266-270	Frontiers of Materials Science in China
2	Effects of ZrB ₂ and SiC dual addition on the oxidation resistance of graphite at 1600-2000°C	(2013), 76, 182-191	Corrosion Science
3	Effects of surface temperature, flow velocity and ambient pressure on the oxidation of graphite at 1400-2000°C in O ₂	(2014), 78, 269-275	Corrosion Science
4	Oxidation behaviors of a C-ZrB ₂ -SiC composite at 2100 °C in air and O ₂	(2014), 30(12), 1223-1229	Journal of Materials Science and Technology
5	Ultra-high temperature oxidation and thermal stability of Ti ₂ AlC in air at 1600-1800°C	(2016), 86, 327-338	Oxidation of Metals
6	Ultra-high temperature oxidation behavior of micro-laminated ZrC/MoSi ₂ coating on C/C composite	(2018), 132, 161-169	Corrosion Science
7	Effects of TaSi ₂ addition on room temperature mechanical properties of composite ZrB ₂ -20SiC composites	(2018), 44, 16150-16156	Ceramics International
8	Oxidation behaviors of ZrB ₂ -SiC-MoSi ₂ composites at 1800 °C in air gases with different pressures	(2019), 157, 87-97	Corrosion Science
9	Ultra-high temperature oxidation resistance of ZrB ₂ -20SiC coating with	(2019), 45, 15366-15374	Ceramics International

	TaSi ₂ addition on siliconized graphite		
10	Improved both mechanical and anti-oxidation performances of ZrB ₂ -SiC ceramics with molybdenum disilicide addition	(2019), 223, 53-59	Materials Chemistry and Physics
11	Oxidation and cracking/spallation resistance of ZrB ₂ -SiC-TaSi ₂ -Si coating on siliconized graphite at 1500°C in air	(2020), 46, 6254-6261	Ceramics International
12	Oxidation and cracking resistances of La ₂ O ₃ modified ZrB ₂ -SiC coating on SiC coated graphite in static air	(2020), 251, 123157	Materials Chemistry and Physics
13	Oxidation resistance and microstructure evolution of ZrB ₂ -SiC-La ₂ O ₃ /SiC dual-layer coating on siliconized graphite at 1800 °C under low air pressures	(2020), 46, 27150-27157	Ceramics International
14	Microstructure and mechanical properties of short-carbon-fiber/Ti ₃ SiC ₂ composites	(2020), 9(6), 716-725	Journal of Advanced Ceramics
15	MC(B)-C-O 体系在超高温条件下相平衡的热力学分析	(2009), 29(4), 301-305	中国腐蚀与防护学报
16	ZrC、ZrC-TaC 增强石墨基复合材料的超高温氧化行为	(2011), 41(1), 66-70	宇航材料工艺
17	石墨基体上 ZrC/MoSi ₂ 微叠层涂层的制备及抗超高温氧化性能	(2016), 36(5), 476-482	中国腐蚀与防护学报
18	热震对包覆 ZrB ₂ -SiC-La ₂ O ₃ /SiC 涂层渗硅石墨力学性能的影响	(2021), 41(1), 29-35	中国腐蚀与防护学报

序号	申请日	专利号	专利名称
1	2014.09.11	ZL 201410462803.9	在室温到超高温下热-力-环境耦合作用测试装置及应用
2	2018.1.31	ZL201810094063.6	一种模块化组合材料高通量热压烧结装置及其使用方法
3	2012.9.21	ZL 201210352858.5	采用多弧离子镀制备以 Cr ₂ AlC 为主相的高温防护涂层的方法
4	2020.8.14	ZL 202010817268.X	一种 ZrB ₂ -SiC-VSi ₂ 超高温陶瓷复合材料及其制备方法
5	2020.12.21	ZL 202011520353.6	一种面向极端环境的热防护材料多功能协同设计方法