



Supplementary Materials

The Oxidation Behavior of ZrB₂-SiC Ceramic Composites Fabricated by Plasma Spray Process

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SEM-EDS analysis has been performed to investigate the coating quality and composition, by analyzing both average composition and different phases present in the coating.

Figure S1 shows the SEM images of metallographic coating cross section referred to B2 ZrB₂-SiC (50%-50%) HPPS process. It compares two halves of the coated specimen in

order to verify the quality of the coating throughout the cross section. Details of the coating have been investigated in SEM images given in Figures S2–S5. Results of the coating EDS analyses, both as area analysis and point analysis, are given in Figures S6,S7.

Figures S8–S15 show the results of SEM-EDS analysis which have performed for B1 ZrB_2 -SiC (70%-30%) process, corresponding to 20 scans process, as it has been considered in the case of B2 ZrB_2 -SiC (50%-50%) process.



Figure S1. SEM image of the coating B2, ZrB2-SiC (50%-50%)—metallographic cross section: two halves of the coating cross section are compared (black area = resin).



Figure S2. SEM image of the coating B2, ZrB2-SiC (50%-50%) – metallographic cross section: details.



Figure S3. SEM image of the coating B2, ZrB2-SiC (50%-50%) – metallographic cross section: coating thickness.



Figure S4. SEM image of the coating B2, ZrB2-SiC (50%-50%)-metallographic cross section: coating thickness.



Figure S5. SEM image of the coating B2, ZrB2-SiC (50%-50%) – metallographic cross section: details.







Figure S6. SEM-EDS analysis of the coating B2, ZrB2-SiC (50%-50%): area analysis.



128- IC 51		F	Point 1
257 -			
	Matrix	Correction	ZAF
386-	ZrL	77.85	32.36
	SiK	01.05	01.42
	OK	00.45	01.07
	CK	20.64	65.15
	Element	Wt%	At%

	Element	Wt%	At%
	СК	22.47	67.36
	OK	00.81	01.82
	SiK	00.60	00.77
-	ZrL	76.12	30.05
	Matrix	Correction	ZAF
e		P	oint 2



	Element	Wt%	At%
	CK	33.79	55.13
	OK	00.59	00.72
	SiK	62.21	43.41
.0 -	ZrL	03.42	00.73
Cnt	Matrix	Correction	ZAF
3- _0			Point 4

	Element	Wt%	At%
	zı CK	25.85	66.59
519-	OK	00.70	01.36
	SiK	09.37	10.32
89-	ZrL	64.08	21.73
	Matrix	Correction	ZAF
259-	Si		
129-			

1	2.010	ement	Wt%	At%
	si C	K	29.62	56.81
.0 -	0)K	00.52	00.75
	Si	K	43.69	35.84
.8 -	Z	rL	26.16	06.61
Cnt	M	atrix	Correction	ZAF
.5 -				
.3 -	Zr			



Figure S7. SEM-EDS analysis of SEM-EDS analysis of the coating B2, ZrB2-SiC (50%-50%): point analysis.



Figure S8. SEM image of the coating B1, ZrB2-SiC (70%-30%)—metallographic cross section: two halves of the coating cross section are compared (black area = resin).



Figure S9. SEM image of the coating B1, ZrB2-SiC (70%-30%) – metallographic cross section: details.



Figure S10. SEM image of the coating B1, ZrB2-SiC (70%-30%)-metallographic cross section: coating thickness.



Figure S11. SEM image of the coating B1, ZrB2-SiC (70%-30%) – metallographic cross section: coating thickness.



Figure S12. SEM image of the coating B1, ZrB2-SiC (70%-30%) – metallographic cross section: details.



Figure S13. SEM image of the coating B1, ZrB2-SiC (70%-30%) – metallographic cross section: details.



Element	Wt%	At%
CK	31.01	67.43
OK	01.43	02.33
SiK	16.92	15.74
T ZrL	50.64	14.50
Matrix	Correction	ZAF
	Element CK OK SiK ZrL Matrix	Element Wt% CK 31.01 OK 01.43 SiK 16.92 T ZrL 50.64 Matrix Correction

Figure S14. SEM-EDS analysis of the coating B1, ZrB2-SiC (70%-30%): area analysis.



	Element	Wt%	At%
	СК	21.89	66.28
0.9 -	OK	01.12	02.54
	SiK	00.54	00.70
0.7 -	Zr ZrL	76.45	30.48
KCnt	Matrix	Correction	ZAF
0.5 -			
0.2 -	1		
			Delint 1

	Element	Wt%	At%
	CK	18.81	62.12
.0 -	OK	00.99	02.46
	SiK	00.56	00.78
.7 -	² ZrL	79.65	34.64
Cnt	Matrix	Correction	ZAF
.5 -			
.2 -			

27	Element	Wt%	At%
	СК	28.04	63.77
1-11	OK	00.87	01.49
	SiK	19.99	19.44
11-	si ZrL	51.10	15.30
	1 2r Matrix	Correction	ZAF
	1000		
10 -			

	Element	Wt%	At%
	CK	33.22	60.34
2 -	OK	00.29	00.40
	SiK	43.46	33.76
9 -	ZrL	23.02	05.51
Cet	Matrix	Correction	ZAF
6 - 3 -			
	Zr		Point 4



	Element	Wt%	At%
	CK	13.02	20.69
	OK	36.57	43.64
	AlK	50.41	35.66
41	Matrix	Correction	ZAF
		CK OK AlK Matrix	ElementW1%CK13.02OK36.57AlK50.41MatrixCorrection



Figure S15. SEM-EDS analysis of SEM-EDS analysis of the coating B1, ZrB2-SiC (70%-30%): point analysis.