

치관보철물 제작에 사용되는 비귀금속합금의 주조성에 관한 실험적 연구(III)

- 합금 재사용에 따른 주조성과 물리적 특성의 변화 -

지산간화보건전문대학 치과기공과

Abstract

The experimental research on the castability of non precious metal alloy which is use for the production of crown and bridge prosthetics(III)

- The change of castability and physical properties according to the recasting. -

Chung, In Sung

Department of Dental Laboratory Technology, Jisen Junior College

The purpose of this investigation was to determine the effect of recasting on the castability and physical properties of the nonprecious metal alloy.

Using 2 sorts of the nonprecious metal alloy for production of Crown and Bridge prosthetics, such as 1) sankin C. B 80 metal 2) C & B alloy, the result of experimental research on the castability and hardness according to the recasting, is as follows;

1. The difference of castability between sankin CB80 metal and C & B alloy was statistically significant ($p < 0.01$) and the difference of castability among the test groups, was statistically significant ($p < 0.01$).
2. In the case of sankin C.B 80 metal, the difference of castability among the New alloy and first mixed alloy and second mixed alloy and old alloy was not significant statistically ($p > 0.05$).
3. In the case of C&B alloy, the difference of castability among the New alloy and mixed alloys and old alloy, was not significant statistically ($p > 0.05$).
4. The difference of hardness between sankin C & B alloy was not significant statistically ($p > 0.05$), but the difference of hardness among the test groups was statistically significant ($p < 0.01$).
5. In the case of Sankin C.B 80 metal, the difference of hardness among the new ally and mixed alloys and old alloy was not significant statistically ($p > 0.05$).
6. In the case of C & B alloy, the difference of hardness between New alloy and mixed alloys was not significant statistically ($p > 0.05$) but the difference of hardness among the old alloy and New alloy and mixed alloys was statistically significant ($p < 0.01$).

목 차

가

Sankin C.B 80metal

C&B alloy

I. 서 론

15~20
가

가

가

가

가

가

가

Harcourt가

가

가

Craig
33~50%

가

가

가

50% 가

가

II. 실험재료 및 방법

1. 실험재료

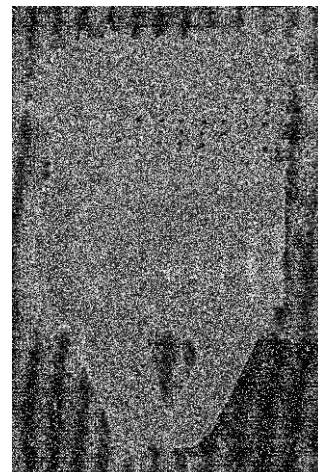
Sankin C.B 80metal(SANKIN
INDUSTRY CO.) C&B alloy(Panatec Corp.,
Japan)
Hi-Temp(Whip-mix CO., U.S.A)

2. 실험방법

가 95 가 (plastic screen
mesh)

가 1.5cm x 1cm
baseplate wax(Dentsply, England)

가 1.5cm x 1cm



1.

1.

합 금	매 물 재	매물재의 혼수비	매물재의 소환온도	합금의 용융온도
Sankin C. B 80	Hi-temp	0.14	800 ℃	1,150 ℃
C & B Alloy	Hi-temp	0.14	800 ℃	1,150 ℃

2.

재료 \ 실험	1 차주조	2 차주조	3 차주조	4 차주조	5 차주조	6 차주조	7 차주조
Sankin C. B 80 metal	new alloy 22.4 g	x_1 ; 11.2g + new alloy 11.2 g	x_2 ; 11.2 g + new alloy 11.2 g	x_3 ; 11.2 g + new alloy 11.2 g	x_4 ; 11.2 g + new alloy 11.2 g	x_5 ; 11.2 g + new alloy 11.2 g	x_6 ; 14.2 g
C & B Alloy	new alloy 20 g	x_1 ; 10g + new alloy 10 g	x_2 ; 10 g + new alloy 10 g	x_3 ; 10 g + new alloy 10 g	x_4 ; 10 g + new alloy 10 g	x_5 ; 10 g + new alloy 10 g	x_6 ; 13.1 g

x_1 : 1차 주조후 남은 합금 x_2 : 2차 주조후 남은 합금 x_3 : 3차 주조후 남은 합금
 x_4 : 4차 주조후 남은 합금 x_5 : 5차 주조후 남은 합금 x_6 : 6차 주조후 남은 합금

baseplate wax

가 95

baseplate wax
wax

84

12 gauge(2.05mm) casting wax(
) direct sprue open
ring

type

가 1/4inch

2

6

0.75mm

ring

< 1 >

Sankin C.B 80 metal C&B Alloy,

2

< 2 >

+

(kerr corp.,

U.S.A)

50 μ m alumium oxide
sand blasting . sand blasting
(sharp, Japen) 10

6

95

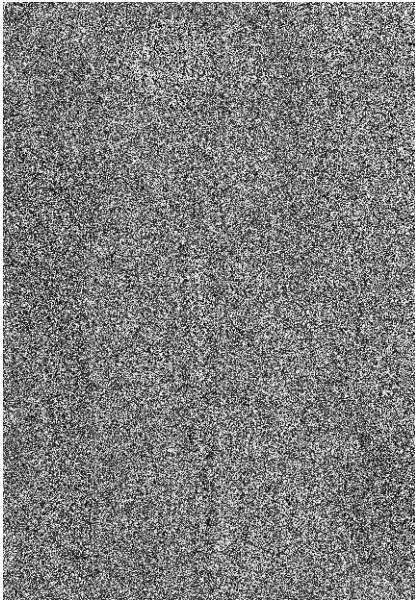
plastic screen mesh
carborundum disk 1.5cm

stone point, rubber wheel

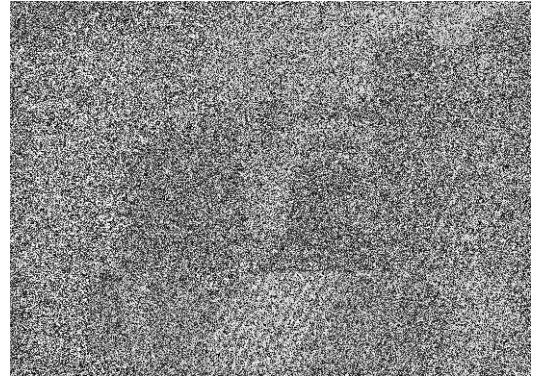
Rockwell hardness B -Scale test(Wilson U.S.A)

.(2)

Sheffe



A: Rockwell hardness test machine



B:

2. Rock well hardness B-scale test

III. 실험결과

1. 주조성

(SD) < 3> (M)
 $2() \times 7()$
 $< 4>$
 $45.80MSe = 45.52p<0.01$
 $11.97MSe = 33.73p<0.01$
 Sheffe

metal 3 Sankin C.B 80
 , 4
 4 , 5 , 1
 , 2 , 1 , 5
 , 4 5 , 3
 , 5
 P<0.01
 1 3
 p<0.05 alloy 4 . C & B
 4 , 2 , 1
 , 4 5 4
 p<0.01 3
 4 , 3 , 4
 p<0.05
 < 3> . < 3>

< 5>

3.

재 료	실 험	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇
Sankin C. B 80 metal	N	5	5	5	5	5	5	5
	M	90.20	88.60	84.20	75.80	67.00	64.60	91.00
	S D	5.08	4.84	2.99	3.92	5.22	4.96	4.60
C & B alloy	N	5	5	5	5	5	5	5
	M	91.80	92.20	94.60	90.80	84.60	93.00	90.80
	S D	2.04	1.60	0.49	3.06	4.08	1.41	0.98

4.

변 량 원	자 승 화	자 유 도	평균 자승화	F
전 체	6,997.77	69		45.80**
피 검 사 간	2,221.20	34		
재 료	2,084.63	1	2,084.63	
간 오 차	136.57	33	45.52	
피 검 사 내	4,776.57	35		11.97**
처 치	2,422.77	6	403.80	
상 호 작 용	1,577.97	6	263.00	
내 오 차	775.83	23	33.73	7.80**

* p < 0.05

** p < 0.01

5.

Shaffe

F 재료간	실험간										
	x ₁ :x ₂	x ₁ :x ₃	x ₁ :x ₄	x ₁ :x ₅	x ₁ :x ₆	x ₁ :x ₇	x ₂ :x ₃	x ₂ :x ₄	x ₂ :x ₅	x ₂ :x ₆	x ₂ :x ₇
Sankin C. B 80 metal	0.05	0.68	3.89**	10.10**	12.29**	0.01	0.36	3.07*	8.75**	10.81**	0.11
C & B alloy	0.01	0.60	0.08	3.97**	0.11	0.08	0.44	0.15	4.42**	0.05	0.15
F 재료간	실험간										
	x ₃ :x ₄	x ₃ :x ₅	x ₃ :x ₆	x ₃ :x ₇	x ₄ :x ₅	x ₄ :x ₆	x ₄ :x ₇	x ₅ :x ₆	x ₅ :x ₇	x ₆ :x ₇	
Sankin C. B 80 metal	1.32	5.55**	7.21**	0.87	1.45	2.35	4.33**	0.11	10.87**	13.08**	
C & B allo	1.11	7.66**	0.20	1.11	2.94*	0.37	2.94*	5.40**	2.94*	0.37	

*P < 0.05

**P < 0.01

2.경도

Sheffe

<

(M)

8>

(SD) < 6>

Sankin
, 2

C.B 80 metal 1

2() × 7()

p<0.05

< 7>

C & B alloy

< 7>

F(1,33) = 3.28,

, 2

, 3

MSe = 1.92, p>0.05

, 4

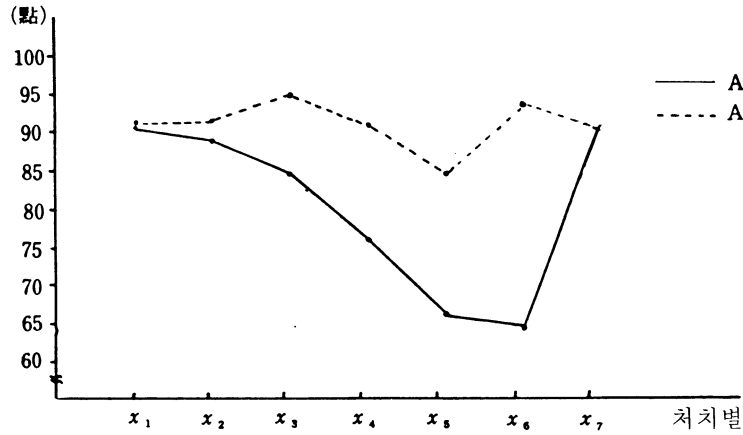
, 5

()

F(6,23) = 6.11,

p<0.01

MSe = 40.29 p<0.01



3.

6.

재료	실험형	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇
Sankin C. B 80 metal	N	5	5	5	5	5	5	5
	M	88.80	91.80	90.80	86.60	86.40	89.80	80.60
	S D	0.75	1.94	1.94	6.80	5.39	1.83	5.16
C & B alloy	N	5	5	5	5	5	5	5
	M	87.40	89.60	92.20	90.40	89.40	88.80	72.80
	S D	3.26	0.80	1.60	2.06	1.96	2.56	7.49

V. 결론

가

Sankin C. B 80 metal C & B alloy 2

Sankin C.B 80metal
 가 (p>0.05) C&B alloy
 가 (p>0.05)
 Nelson - 10
 가 C & B alloy
 (p>0.01)

1. Sankin C. B 80 metal C & B alloy 가 (p>0.01)
2. Sankin C. B 80 metal , 2 , 가 (p>0.05). , 1
3. C & B alloy 가 (p>0.05).
4. Sankin C. B 80 metal C & B alloy 가 (p>0.05)
5. Sankin C. B 80 metal 가 (p>0.01).
6. C & B alloy 가 (p>0.05).
- 가 (p>0.05)
- 가 (p>0.01).

carbide nitride
 Anderson carbide
 nitride
 carbide nitride가

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