

# Ring Furnace를 이용한 Acrylic Resin의 온성에 관한 연구

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## Abstract

### A Study on the Heat-Curing of Acrylic Resin using Ring Furnace

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The purpose of this study was to evaluate the effect of curing time and curing temperature on the heat-curing of acrylic resin using ring furnace.

Specimens were fabricated from 2 kinds(Laboron, Bertex) heat-cured resin. Total 200 samples were divided into 4 groups(70°C, 100°C, 130°C, 150°C) and each group was divided into 5 small groups(30 min., 45min., 60min., 75min., 90min.). A microscope(Olympus Coll Co. Japan) was used to examine a randomly selected central zone, midzone and surface for each complete specimen.

The results of the experiment were as follows :

1. To obtain non-polymerization, cure the resin for 30 minutes at 70°C and 100°C in a ring furnace.
2. To obtain with porosity, cure the resin for 45 minutes, 60 minutes and 75 minutes at 70°C and for 90 minutes at 150°C in ring furnace. Porosity appears in Laboron for 30 minutes, 45 minutes at 150°C in a ring furnace.
3. Every other specimens cannot get a sight of special problem with makes eye in the maked surface.

## 1. 서론

Acrylic resin 가 1937 douge method 가 resin 가 curing unit 가 water-bath, dry-oven, induction, dielectric heating, infrared, steam 가 water-bath 가

1-3),  
4),  
5).

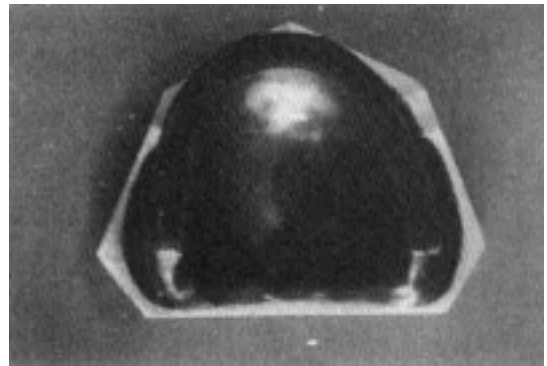
Water bath  
 Tuckfield W.J. (1943)<sup>6)</sup>, Woelfel J. B.(1959)<sup>7)</sup>, McCabe J.F. (1980)<sup>8)</sup>, Craig R.C.(1985)<sup>9)</sup>, Honorez P(1989)<sup>10)</sup>  
 가 infrared Han-Kuang Tan & Brudvik J.S.(1989)<sup>11)</sup>, Caputo T.L. & Ryan J.E.(1989)<sup>12)</sup> 가 .  
 microwave  
 Levin B & Sanders J.L.(1989)<sup>13)</sup>, Ogal R.E. et at.(1986)<sup>14)</sup>, Dcori D.A.(1988)<sup>15)</sup>  
 Dry-oven Taicher S. & Steinberg H.M.(1985)<sup>16)</sup>, Tcolson L.B. & Taylor T.D.(1989)<sup>17)</sup>

dry-oven resin  
 curing maxillofacial  
 prosthetics

가 electric  
 furnace (water curing  
 unit, Triad VLC curing unit, microwave oven  
 ) curing  
 가  
 resin

## 2. 실험방법

4 (A,B,C,D)  
 .  
 A 50  
 2mm  
 wax baseplate ridge crest  
 7mm, ( 10mm,  
 7mm) wax rim 5  
 5 2  
 resin ( 1).



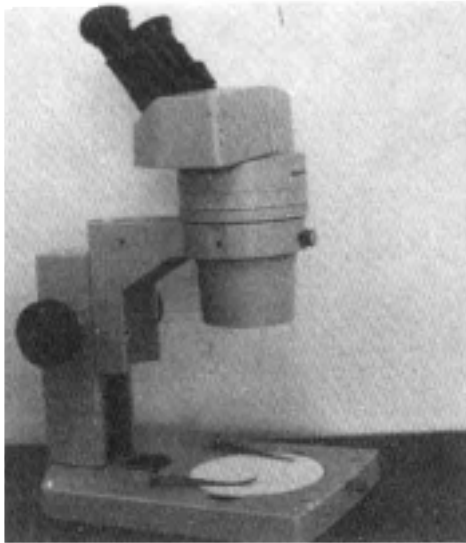
1. Baseplate wax

## II. 실험재료 및 방법

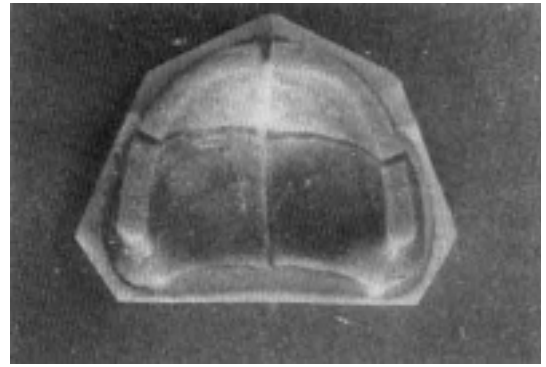
### 1. 실험재료

- (1) Heat curing resin : Laboron, G-C Co, Japan Vertex, Dentimex zeist, Holland.
- (2) Resin separator : Acro-sep, G-C Co, Japan.
- (3) Plaster : Dental Caster, Yoshino Gypsum Sales, Japan.
- (4) Base plate wax : Dental paraffin wax, , Korea.
- (5) Model stone : MG MG dental stone, MG Co. Japan.

flask ring furnace  
 wax  
 resin  
 resin(Laboron) mixing douge  
 stage gauge가 flask press(SAM  
 KI, Japan)  
 resin flask ring furnace(  
 , Korea) 70 (160 )  
 30 , 45 , 60 , 75 , 90  
 resin(Vertex)  
 50



2. 10x (Olympus CO11 Microscope, Japan)



3.

10 (Olympia Co, Japan)  
 ( 2).  
 B A flask  
 ring furnace 100 (212 )  
 30 , 45 , 60 , 75 , 90  
 2 resin A

C A  
 130 (265 )  
 D A  
 150 (300 )

### III. 실험결과 및 고찰

#### 1. 실험결과

Ring furnace( )

1  
 70 , 100 30

70 45 , 60 , 75  
 150 90 , Laboron 30 , 45  
 porosity가 70 45  
 micro porosity가 resin  
 porosity 가  
 가 .  
 가 .

1.

	a	b	c	d	e
VA	non	porosity	porosity	porosity	*
LA	non	porosity	porosity	porosity	*
VB	non	*	*	*	*
LB	non	*	*	*	*
VC	*	*	*	*	*
LC	*	*	*	*	*
VD	*	*	*	*	porosity
LD	porosity	porosity	*	*	porosity

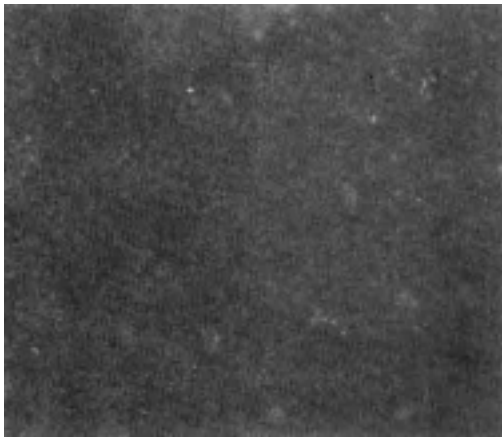
V : VERTEX

L : LABORON

A : 70°C B : 100°C C : 130°C D : 150°C

a : 30min b : 45min c : 60min d : 75min e : 90min

\* : non-porosity non : non-polymerzation



4. 10x

## 2. 고찰

Tuckfield<sup>6)</sup> 70 100  
 Mccabe Wilson<sup>8)</sup>  
 100 110 가  
 74  
 Craig<sup>9)</sup> 70 , 100 30  
 Craig가  
 flask 가 18)  
 Taicher<sup>16)</sup> 70 80 dry-oven 10  
 curing  
 70 45 , 60 , 75 resin  
 150 90  
 curing monomer가  
 gas  
 4,5,18,19)  
 Craig가 150  
 furnace  
 dry-oven resin base

monomer

가

## IV. 결론

ring furnace( )  
 2  
 heat-curing resin  
 200 10 , ) 가  
 1. 70 30 , 100 30  
 2. 70 45 , 60 , 75 150  
 90 porosity가  
 Laboron 150 30 , 45  
 porosity가  
 3. 가

## 참고문헌

1. Graser GN : Compelted bases for removable dentures. J Prosthet Dent 1978 : 39 : 232~6.
2. Heartwell CM Jr. Rahn AO : Syllabus of

- complete dentures. 3rd ed. Philadelphia. Lea & Febiger, 1980 : 238~9.
3. Hickey JC, Zarb, Bolender CL : Boucher's prosthodontic treatment for edentulous patients. 9th ed. St Louis, CV Mosby Co, 1985 : 298.
  - 4.9. Craig RG : Restorative dental materials. 7th ed. St Louis, CV Mosby Co, 1985 : Chap 19.
  5. Phillips RW : Skinner's science of dental materials. 8th ed. Philadelphia, WB Saunders Co, 1982 : chap 12.
  6. Tuckfield WJ : Acrylic resins in dentistry. part 2. their use for denture construction, Aust J Dent 1943 : 47 : 1~26.
  7. Woelfel JB & Paffenbarger GC : Method of evaluating the clinical effect of warping a denture, report of a case, J Am Dent Assoc, 1959 : 59 : 250~60.
  8. McCabe JF & Wilson HJ : The use of differential scanning calorimetry for the evaluation of dental materials. part 2, denture base materials, J Oral Rehabil 1980 : 7 : 235~43.
  10. Honorez P & Catalan A et al : The effect of three processing cycles on some physical and chemical properties of a heat-cured acrylic resin, J Proth Dent, Vol. 61. No 4, 1989 : 510~17.
  11. Kuang Tan H & Brudvik JS et al : Adaptation of a visible lightcured denture base material. J Proth Dent. Vol.61, No.3, 1989 : 326~31.
  12. Caputo TL & Ryan JE : An easy, fast technique for making immediate surgical obturators, J Proth Dent, Vol.61, No.4, 1989 : 473~5.
  13. Levin B & Sanders JL, Reitz PV : The use of microwave energy for processing acrylic resins. J Proth Dent. Vol.61, No.3, 1989 : 381~3.
  14. Ogle RE & Sorensen SE, Lewis EA : A new visible light-cured resin system applied to removable prosthodontics, J Proth Dent, Vol. 56, 1986 : 497~506.
  15. Dcori RA & Huggett R, et al : Microwave irradiation versus conventional water bath curing : Effects on mechanical properties of acrylic resins. QDT yearbook Vol.12, 1988 : 187~92.
  16. Taicher S & Steinberg HM, et al : Modified stock-eye ocular prosthesis, J Proth Dent, Vol.54, No.1, 1985 : 95~8.
  17. Toolson LB & Tayloe TD : Method for denture identification, J Proth Dent, Vol.61, No.1, 1989 : 114~5.
  18. 정인성 : 치과재료학, 신광출판사, p.257, 1986.
  19. 김웅철 : 치과재료학, 대학서림, pp.156~9, 1987.