

Influence of Initiator System and Temperature on Real Time Double Bond Conversion

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Objectives: The aim of this study was to examine the influence of the initiator system of light, self and dual cured composites on double bond conversion at 23 and 35°C. **Methods:** The experimental composites were made on the base of Tetric Ceram (IvoclarVivadent). Different initiators have been used, for light curing CC(Campherquinone)/Amine, for self curing BPO (Catalyst(C)), Amine (Base(B)) and dual curing BPO (C), 2 Amines, CC (B). The conversion was measured at 23°C and 35°C. For light curing an Astralis 7 (IvoclarVivadent) with 700 mW/cm² for 60s was used. The double bond conversions were registered every 5s for 1h with FTIR. Additionally the dual curing composite have been self cured for 1h and than light cured for 60s, the double bond was detected for totally 2 h. The data were analyzed by ANOVA (p= 0.05, n=3).

Results:

Double Bond Conversion [%]

		23°C			35°C		
		1min	10min	60min	1min	10min	60min
	light	45 a,c	51 a	55 a,d	51 b	56	60 a
	self	0 b	19	47b,d	0 a	44 a	56 b
dual	B light	47 a,c	54 a,b	59a,c	52 b	58 b	63 a,c
dual	B+C light	50 c	56 b	60c	55 b	60 b	65 c
dual	B+C self *	0 b	11	50 a,b,d	0 a	42 a	56 b
dual	*+light			62 (2h)			63 (2h)

Identical letters indicate no statistical difference. **Conclusion:** The initiator/accelerator for self curing increased the double bond conversion after light curing. The highest conversion rate for light curing have been in the first 10 s. The higher conversion at 35°C happened in the early seconds of the light curing, this influences the final double bond conversion of the composites. A significant increase of the double bond conversion of a self cured dual curing composite after 1 h is possible.