



REFERENCES

- Ferracane, J.L. (1992). Using posterior composites appropriately. Journal of American Dental Association, 123, 53-58.
- Full, C.A. and Hollander, W.R. (1993). A literature review part III. What the future holds. Journal of Dentistry in Children, 60, 57-60.
- Giannelis, E.P. (1996). Polymer layered silicate nanocomposites. Advance Materials, 8(1), 29-35.
- Ishida, H., Campbell, S., and Blackwell, J. (2000). General approach to nanocomposites preparation. Chemistry of Materials, 12, 1260-1267.
- Layrolle, P. and Lebugle, A. (1996). Synthesis in pure ethanol and characterization of nanosized calcium fluoroapatite. Chemistry of Materials, 8, 134-144.
- Moszner, N. and Salz, U. (2001). New development of polymeric dental composites. Progress in Polymer Science, 264, 97-116.
- Peutzfeldt, A. (1997). Resin composites in dentistry: the monomer systems. European Journal of Oral Science, 105, 97-116.
- Roy, R. (1987). Ceramics by the solution sol-gel route. Science, 238 (4834), 1664-1669.
- Tirtha, R., Fan, P.L., Dennison, J.B., and Powers, J.M. (1982). In vitro depth of cure of photo activated composites. Journal of Dental Restoration, 61, 1184-1187.

APPENDICES

Appendix A Microhardness Test

Table 1 Microhardness of silanized silica filled BT dental resin composites

Number of Sample	Vickers Hardness Number (VHN)					Average	SD
	1	2	3	4	5		
BT5546							
1	28.50	32.90	29.00	30.30	28.30	29.80	1.90
2	27.30	23.40	29.20	29.30	26.90	27.22	2.40
3	31.10	29.40	30.60	30.90	30.20	30.44	0.70
4	31.20	26.10	29.00	29.60	30.60	29.30	2.00
5	29.60	20.30	25.60	29.10	27.30	26.38	3.70
						28.63	1.70
BT5537							
1	34.20	31.90	33.80	35.40	31.30	33.32	1.70
2	34.90	36.60	46.70	35.70	35.30	37.84	5.00
3	36.20	35.40	34.10	35.50	37.60	35.76	1.30
4	36.90	36.90	34.80	33.30	34.80	35.34	1.60
5	36.40	36.40	35.50	35.40	35.00	35.74	0.60
						35.60	1.60
BT7246							
1	20.20	21.80	20.10	20.70	21.40	20.84	0.70
2	21.60	23.30	22.70	23.60	21.90	22.62	0.90
3	20.80	23.40	16.60	19.90	20.60	20.26	2.40
4	22.20	23.40	22.90	22.40	24.30	23.04	0.80
5	24.40	19.50	25.00	25.00	22.20	23.22	2.40
						21.99	1.40
BT7237							
1	38.50	41.10	38.30	37.20	37.70	38.56	1.50
2	36.00	35.40	39.60	36.50	33.90	36.28	2.10
3	31.40	40.90	37.60	36.50	33.90	36.06	3.60
4	39.10	40.00	43.30	39.10	40.60	40.42	1.70
5	33.10	36.80	37.90	33.50	33.80	35.02	2.20
						37.27	2.22

Table 2 Microhardness of silanized silica UT dental resin composites

Number of Sample	Vickers Hardness Number (VHN)					Average	SD
	1	2	3	4	5		
UT5546							
1	29.40	23.80	23.20	24.40	21.80	24.52	2.89
2	26.00	26.20	25.60	25.00	25.60	25.68	0.46
3	26.30	24.90	26.00	25.40	24.60	25.44	0.72
4	27.30	26.20	25.50	23.20	23.80	25.20	1.69
5	26.10	27.00	27.30	26.40	27.20	26.80	0.52
						25.53	1.26
UT5537							
1	32.10	28.30	28.30	28.30	27.80	28.96	1.77
2	28.60	29.00	28.20	27.40	28.90	28.42	0.65
3	30.60	32.10	29.80	32.00	30.40	30.98	1.02
4	32.40	28.40	28.00	28.80	28.40	29.20	1.81
5	30.90	31.50	29.80	29.80	32.30	30.86	1.09
						29.68	1.27
UT7246							
1	27.10	23.70	21.80	21.10	21.40	23.02	2.50
2	20.50	25.40	19.80	19.30	19.20	20.84	2.60
3	21.10	23.60	23.20	21.70	20.40	22.00	1.40
4	19.60	18.70	21.30	21.70	21.70	20.60	1.40
5	20.50	19.20	19.70	26.10	20.20	21.14	2.80
						21.52	1.00
UT7237							
1	32.00	31.70	31.70	31.70	35.30	32.48	1.60
2	32.10	33.30	31.10	30.20	32.00	31.74	1.20
3	31.60	35.40	31.30	33.80	35.90	33.60	2.10
4	39.90	42.30	37.30	34.50	35.70	37.94	3.20
5	37.30	41.70	33.50	32.50	32.10	35.42	4.10
						34.24	2.50

Table 3 Microhardness UDMA dental composites and commercial composites

Number of Sample Unfilled UD resin	Vickers Hardness Number (VHN)					Average	SD
	1	2	3	4	5		
1	16.30	17.60	20.70	18.50	18.30	18.28	1.60
2	16.40	16.30	15.70	16.10	14.70	15.84	0.69
3	18.50	18.00	18.30	17.90	18.00	18.14	0.25
4	16.40	17.00	14.80	15.30	16.20	15.94	0.88
5	15.50	13.20	13.00	12.80	14.80	13.86	1.21
						16.41	0.93
UD46							
1	30.80	25.50	25.80	28.70	30.90	28.34	2.61
2	28.10	30.20	31.20	28.10	29.70	29.46	1.35
3	33.90	32.90	33.40	34.80	34.20	33.84	0.73
4	31.20	29.30	32.10	29.80	33.80	31.24	1.81
5	25.90	27.10	24.20	28.20	30.60	27.20	2.41
						30.02	1.78
UD37							
1	42.40	41.40	43.90	43.30	42.40	42.68	0.96
2	39.40	35.90	33.30	34.90	36.40	35.98	2.25
3	34.40	38.20	40.80	34.40	37.50	37.06	2.72
4	38.10	37.50	37.90	38.50	33.90	37.18	1.87
5	34.90	36.30	39.20	38.80	38.50	37.54	1.86
						38.09	1.93
Aelite							
1	66.60	58.20	66.40	60.70	66.90	63.76	4.04
2	65.90	62.40	62.70	57.50	61.80	62.06	3.01
3	63.70	61.80	58.00	68.40	64.00	63.18	3.77
4	69.10	67.20	64.20	63.70	64.90	65.82	2.27
5	70.80	65.90	71.60	71.00	70.00	69.86	2.29
						64.94	3.07
Amelogen							
1	56.50	53.90	56.00	52.50	52.30	54.24	1.94
2	52.50	48.20	48.20	51.90	59.70	52.10	4.70
3	58.30	52.80	53.40	51.30	49.60	53.08	3.27
4	44.10	50.20	51.00	50.40	51.00	49.34	2.95
5	55.00	53.90	51.30	49.90	46.50	51.32	3.37
						52.02	3.25

Table 4 Microhardness of silanized silica UT dental resin composites

Number of Sample	Vickers Hardness Number (VHN)					Average	SD
	1	2	3	4	5		
1%TET							
1	14.50	14.50	15.00	13.80	14.90	14.54	0.47
2	15.50	15.30	15.80	16.30	15.10	15.60	0.47
3	15.40	16.80	16.50	15.60	14.70	15.80	0.85
4	14.80	14.30	14.90	13.90	15.20	14.62	0.52
5	17.60	19.40	18.70	14.50	17.60	17.56	1.87
						15.62	0.84
2%TET							
1	12.40	12.20	13.70	12.30	12.80	12.68	0.61
2	12.40	12.40	12.80	14.90	13.00	13.10	1.04
3	13.30	13.00	12.20	12.80	13.10	12.88	0.42
4	13.30	13.00	13.20	12.80	13.20	13.10	0.20
5	13.10	13.00	13.50	13.00	12.30	12.98	0.43
						12.95	0.54
4%TET							
1	14.30	14.50	12.00	13.80	13.20	13.56	1.01
2	15.60	12.30	12.90	13.70	12.20	13.34	1.40
3	13.70	11.20	13.10	12.50	12.50	12.60	0.93
4	9.50	10.10	9.10	12.60	9.70	10.20	1.39
5	11.10	11.30	11.60	11.70	11.10	11.36	0.28
						12.22	1.00
8%TET							
1	13.40	14.00	10.40	11.60	12.60	12.40	1.44
2	13.20	10.90	12.00	12.70	14.30	12.62	1.28
3	13.00	8.80	12.60	12.10	12.00	11.70	1.67
4	12.40	10.50	11.90	10.20	9.00	10.80	1.37
5	10.40	9.90	10.10	9.70	9.60	9.94	0.32
						11.49	1.21
16%TET							
1	9.90	9.30	9.90	8.30	9.10	9.30	0.66
2	12.90	11.30	13.10	11.70	12.80	12.36	0.80
3	13.80	11.60	13.00	11.70	12.20	12.46	0.93
4	7.60	8.00	7.60	7.30	7.90	7.68	0.28
5	7.30	7.70	7.00	7.00	7.80	7.30	0.46
						9.82	0.63

Table 5 Microhardness of 1,2,4,8,16% HEXA dental nanocomposites

Number of Sample	Vickers Hardness Number (VHN)					Average	SD
	1	2	3	4	5		
1% HEXA							
1	13.20	12.10	12.70	11.00	12.70	12.34	0.84
2	14.00	15.70	15.50	14.00	15.10	14.86	0.81
3	16.50	15.70	16.10	14.40	15.10	15.68	0.79
4	17.20	13.60	16.20	13.70	15.90	15.32	1.60
5	15.30	12.80	16.20	14.70	12.00	14.20	1.75
						14.48	1.16
2 % HEXA							
1	17.60	16.60	18.90	17.10	16.50	17.34	0.98
2	14.50	11.70	14.60	13.90	13.20	13.58	1.19
3	16.60	16.80	18.60	17.00	16.80	17.16	0.82
4	15.20	14.60	15.30	15.20	15.60	15.18	0.36
5	13.70	13.10	14.10	13.70	13.70	13.66	0.36
						15.38	0.74
4 % HEXA							
1	14.50	14.00	14.10	13.50	13.70	13.96	0.38
2	14.10	13.90	14.10	13.80	13.60	13.90	0.21
3	13.50	14.10	13.50	13.40	13.20	13.54	0.34
4	13.00	12.90	13.30	13.50	13.20	13.18	0.24
5	13.30	13.60	13.70	13.50	14.90	13.80	0.63
						13.68	0.36
8 % HEXA							
1	16.30	15.20	15.30	16.90	15.80	15.90	0.71
2	14.30	13.70	12.60	14.70	14.80	14.02	0.90
3	15.50	16.20	15.40	17.00	16.50	16.12	0.68
4	18.00	15.80	13.90	16.80	16.70	16.24	1.52
5	17.30	16.40	15.70	15.90	15.50	16.16	0.72
						15.68	0.91
16 % HEXA							
1	14.80	13.00	14.90	14.00	13.50	14.04	0.82
2	12.30	11.50	11.10	12.30	9.90	11.42	1.00
3	16.70	15.00	16.20	7.40	13.70	15.80	1.46
4	17.00	17.50	16.60	16.10	16.90	16.82	0.52
5	17.10	16.40	17.70	17.00	16.30	16.90	0.57
						15.00	0.87

Table 6 Microhardness of 1,2,4,8,16 % OC dental nanocomposites

Number of Sample	Vickers Hardness Number (VHN)					Average	SD
	1	2	3	4	5		
1 %OC							
1	13.50	13.00	14.00	13.60	12.80	13.38	0.48
2	14.20	14.20	14.20	14.00	14.00	14.12	0.11
3	14.00	14.20	14.20	13.40	13.90	13.94	0.33
4	12.30	13.20	14.10	14.10	10.80	12.90	1.39
5	13.80	12.90	14.80	14.40	13.80	13.94	0.72
						13.66	0.61
2 %OC							
1	15.40	16.40	12.60	12.90	14.30	14.32	1.62
2	14.10	13.50	12.60	12.60	13.10	13.18	0.64
3	13.60	15.60	14.40	13.00	13.00	13.86	1.08
4	11.90	12.30	13.10	13.00	12.20	12.50	0.52
5	16.30	14.50	16.80	14.10	13.50	15.04	1.43
						13.78	1.06
4 %OC							
1	12.00	12.00	12.40	12.00	11.90	12.06	0.91
2	11.70	12.00	12.20	12.20	11.70	11.96	0.25
3	12.30	12.30	11.90	11.90	11.80	12.04	0.24
4	15.00	15.20	10.90	12.40	13.30	13.36	1.81
5	13.10	14.80	11.80	15.60	13.50	13.76	1.48
						12.64	0.80
8 %OC							
1	13.50	9.20	10.70	11.20	11.70	11.26	1.56
2	10.00	8.80	8.20	9.10	9.00	9.02	0.65
3	15.10	13.40	13.20	14.80	13.40	13.98	0.90
4	17.00	16.30	14.80	14.70	16.10	15.78	1.00
5	14.70	12.80	15.80	15.20	10.80	13.86	2.05
						12.78	1.23
16 %OC							
1	7.90	7.80	7.50	6.50	7.30	7.40	0.56
2	7.80	8.80	7.80	6.80	7.80	7.80	0.71
3	8.60	7.20	7.80	8.10	7.90	7.92	0.51
4	8.00	9.60	8.50	8.40	8.40	8.58	0.60
5	7.80	8.20	8.00	7.70	7.50	7.84	0.37
						7.91	0.53

Table 7 Microhardness of 1,2,4,8,16 % HEXT dental nanocomposites

Number of Sample	Vickers Hardness Number (VHN)					Average	SD
	1	2	3	4	5		
1%HEXT							
1	15.5	14.6	16.8	14.9	14.7	15.3	0.91
2	17.4	14	18.3	14	17.4	16.22	2.06
3	16.9	17.7	17.4	16.6	14.8	16.68	1.13
4	13.5	13.2	13.8	14.2	14	13.74	0.4
5	13.7	13.8	13.9	13.9	13.9	13.84	0.09
						15.16	0.92
2%HEXT							
1	14	13.5	14	14.9	14	14.08	0.51
2	13.7	13.5	13.9	13.7	13.7	13.7	0.14
3	13.9	14.1	13.7	13.7	13.8	13.84	0.2
4	14	15.6	14.9	15.3	13.1	14.58	1.02
5	15.4	14.8	15.5	15	14.8	15.1	0.33
						14.26	0.43
4%HEXT							
1	13.8	12.7	13.5	13.6	13	13.32	0.45
2	16.9	15.3	14	17.1	17.8	16.22	1.5
3	16.7	12	17.3	15	13.4	14.88	2.22
4	14	13.3	14.3	13.4	12.3	13.46	0.77
5	13.1	14.5	13	12.9	13.4	13.38	0.65
						14.25	1.13
8%HEXT							
1	13.1	13.5	13	13.6	14.6	13.56	0.6
2	13.3	13.5	14.3	14.4	14.4	13.98	0.54
3	14.5	13.8	14.3	13.8	13.7	14.02	0.36
4	13.6	13.1	13.9	13.2	13.9	13.54	0.38
5	14.1	13.9	14.9	15.6	14.4	14.54	0.67
						13.93	0.51
16%HEXT							
1	15	13.5	13.7	14.5	14.8	14.3	0.67
2	14.7	14.5	14	13.9	10.5	13.52	1.72
3	16.6	14.8	16.1	15.1	15.5	15.62	0.73
4	12.4	11.8	11.9	11.1	12.1	11.86	0.48
5	12.8	12.2	11.6	12.1	12.4	12.22	0.44
						13.5	0.8

Table 8 Microhardness of 1,2,4,8,16 % OCT dental nanocomposites

Number of Sample	Vickers Hardness Number (VHN)					Average	SD
	1	2	3	4	5		
1%OCT							
1	9.30	8.60	9.60	9.10	9.70	9.26	0.44
2	8.60	8.10	8.90	8.90	9.10	8.72	0.39
3	12.80	12.90	11.60	11.90	12.40	12.32	0.56
4	12.50	13.20	13.20	15.60	13.50	13.60	1.18
5	11.70	8.40	8.40	8.60	13.10	10.04	2.21
						10.79	0.96
2%OCT							
1	8.10	10.10	8.60	8.60	8.90	8.86	0.75
2	8.90	8.80	8.60	8.90	9.60	8.96	0.38
3	9.20	8.70	8.80	8.10	8.30	8.62	0.43
4	12.60	12.70	13.40	14.20	14.20	13.24	0.64
5	8.40	9.80	11.20	10.60	10.60	9.92	1.06
						10.29	0.65
4%OCT							
1	14.90	9.90	7.60	16.90	11.50	12.16	3.75
2	8.90	9.10	8.90	10.40	9.10	9.28	0.63
3	12.30	13.40	12.80	13.00	12.70	12.84	0.40
4	9.90	7.70	6.10	7.70	8.00	7.88	1.35
5	9.50	9.30	9.20	9.10	9.30	9.28	0.15
						10.29	1.26
8%OCT							
1	12.40	12.20	12.80	13.40	13.50	12.86	0.58
2	7.10	7.10	7.30	8.10	8.40	7.60	0.61
3	14.40	11.80	10.60	9.70	12.90	11.88	1.86
4	10.10	10.80	9.10	8.80	8.30	9.42	1.01
5	14.80	16.00	13.10	13.60	12.30	13.96	1.46
						11.14	1.10
16%OCT							
1	9.80	9.20	9.30	8.80	8.90	9.20	0.39
2	14.30	12.40	12.90	13.30	9.10	12.40	1.97
3	9.00	8.90	9.70	9.30	9.20	9.22	0.31
4	10.80	11.00	10.90	11.30	10.80	10.96	0.21
5	10.10	10.20	10.20	10.20	10.10	10.16	0.05
						1039.00	0.59

Table 9 Microhardness of 1,2,4,8,16 % OCT dental nanocomposites

Number of Sample	Vickers Hardness Number (VHN)					Average	SD
	1	2	3	4	5		
5%CHA							
1	15.60	16.30	15.30	14.80	16.10	15.62	0.61
2	16.40	15.60	17.30	15.50	17.50	16.46	0.93
3	16.10	15.70	16.00	15.60	15.60	15.80	0.23
4	15.50	15.50	15.50	15.80	15.90	15.64	0.19
5	14.90	14.90	14.90	14.90	16.10	15.18	0.52
						15.74	0.50
10%CHA							
1	15.70	16.40	16.60	16.50	16.90	16.42	0.44
2	15.50	15.70	20.40	16.90	19.00	17.50	2.14
3	17.90	16.70	15.50	15.40	18.40	16.78	1.36
4	16.60	16.20	15.60	15.70	17.10	16.24	0.63
5	15.80	20.70	15.20	16.30	16.10	16.82	2.21
						16.75	1.36
15%CHA							
1	19.90	19.00	18.80	18.80	18.80	19.06	0.48
2	16.50	16.30	16.00	15.70	15.70	16.04	0.36
3	15.70	15.70	15.80	16.90	17.20	16.26	0.73
4	16.10	15.90	15.20	14.50	14.60	15.26	0.73
5	16.40	16.30	16.40	16.40	16.90	16.48	0.24
						16.62	0.51
20%CHA							
1	15.30	15.20	15.80	14.60	14.80	15.14	0.47
2	15.20	15.40	15.70	15.60	18.00	15.98	1.15
3	17.10	17.50	14.30	14.30	14.20	15.48	1.67
4	13.90	14.60	14.40	14.50	15.10	14.50	0.43
5	12.20	11.60	14.10	14.90	15.00	13.56	1.57
						14.93	1.06

Appendix B: Diametral Tensile Strength (DTS)

Table 1 DTS of BT dental composites

BT5546		
Number of specimens	Load at Failure (N)	Diametral Tensile Strength (MPa)
1	740	26.16
2	742	26.23
3	761	26.90
4	732	25.88
5	740	26.16
Mean	743	26.27
SD	10.77	0.38
BT5537		
1	703	24.85
2	709	25.07
3	693	24.50
4	738	26.09
5	757	26.76
Mean	720	25.45
SD	26.61	0.94
BT7246		
1	861	30.44
2	795	28.11
3	852	30.12
4	797	28.18
5	856	30.26
Mean	832.2	29.42
SD	33.21	1.17
BT7237		
1	627	22.17
2	658	23.26
3	606	21.42
4	609	21.53
5	598	21.14
Mean	619.6	21.91
SD	23.94	0.85
BT55 unfilled resin		
1	388	13.72
2	460	16.26
3	593	20.96
4	647	22.87
5	462	16.33
Mean	510	18.03
Sd	106.47	3.76
BT72 unfilled resin		
1	592	20.93
2	537	18.98
3	636	22.48
4	562	19.87
5	546	19.30
Mean	574.6	20.31
Sd	40.20	1.42

Table 2 DTS of UT dental composites

UT5546		
Number of specimens	Load at Failure (N)	Diametral Tensile Strength (MPa)
1	840	29.70
2	795	28.11
3	862	30.47
4	840	29.70
5	856	30.26
Mean	838.6	29.65
SD	26.24	0.93
UT5537		
1	714	25.24
2	674	23.83
3	693	24.50
4	744	26.30
5	631	22.31
Mean	691.2	24.44
SD	42.52	1.50
UT7246		
1	784	27.72
2	793	28.04
3	812	28.71
4	862	30.47
5	866	30.62
Mean	823.4	29.11
SD	38.44	1.36
UT7237		
1	653	23.09
2	679	24.01
3	676	23.90
4	701	24.78
5	717	25.35
Mean	685.2	24.22
SD	24.60	0.87
UT55 unfilled resin		
1	595	21.04
2	620	21.92
3	593	20.96
4	595	21.04
5	595	21.04
Mean	599.6	21.20
SD	11.44	0.40
UT72 unfilled resin		
1	647	22.87
2	647	22.87
3	593	20.96
4	647	22.87
5	658	23.26
Mean	638.4	22.57
SD	25.82	0.91

Table 3 DTS of UD dental composites and commercial composites

UD46		
Number of specimens	Load at Failure (N)	Diametral Tensile Strength (MPa)
1	886	31.32
2	848	29.98
3	811	28.67
4	864	30.55
5	905	31.99
Mean	862.8	30.50
SD	36.13	1.28
UD37		
1	668	23.62
2	662	23.40
3	634	22.41
4	634	22.41
5	650	22.98
Mean	649.6	22.97
SD	15.65	0.55
Unfilled UD		
1	675	23.86
2	685	24.22
3	660	23.33
4	685	24.22
5	658	23.26
Mean	672.6	23.78
SD	13.09	0.46
Aelite		
1	1219	43.10
2	1213	42.88
3	1235	43.66
4	1238	43.77
5	1251	44.23
Mean	1231.2	43.53
SD	15.27	0.54
Amelogen		
1	1358	48.01
2	1360	48.08
3	1139	40.27
4	1210	42.78
5	1138	40.23
Mean	1241	43.87
SD	111.61	3.95

Table 4 DTS of CHA filled dental composites

CHA 5%		
Number of specimens	Load at Failure (N)	Diametral Tensile Strength (MPa)
1	884	31.25
2	958	33.87
3	949	33.55
4	919	32.49
5	818	28.92
Mean	905.6	32.02
SD	56.90	2.01
CHA10%		
1	977	34.54
2	945	33.41
3	997	35.25
4	956	33.80
5	914	32.31
Mean	957.8	33.86
SD	31.59	1.12
CHA15%		
1	922	32.60
2	1048	37.05
3	1154	40.80
4	1182	41.79
5	905	31.99
Mean	1042.2	36.85
SD	127.82	4.52
CHA 20%		
1	834	29.48
2	834	29.48
3	844	29.84
4	847	29.94
5	807	28.53
Mean	833.2	29.46
SD	15.77	0.56

Table 5 DTS of TET dental nanocomposites

1%TET		
Number of specimens	Load at Failure (N)	Diametral Tensile Strength (MPa)
1	1090	38.54
2	999	35.32
3	948	33.52
4	1079	38.15
5	961	33.97
Mean	1015.4	35.90
SD	65.92	2.33
2%TET		
1	926	32.74
2	754	26.66
3	830	29.34
4	886	31.32
5	862	30.47
Mean	851.6	30.11
SD	64.84	2.29
4%TET		
1	958	33.87
2	964	34.08
3	942	33.30
4	886	31.32
5	945	33.41
Mean	939	33.20
SD	30.98	1.10
8%TET		
1	1034	36.56
2	1082	38.25
3	1039	36.73
4	1042	36.84
5	964	34.08
Mean	1032.2	36.49
SD	42.65	1.51
16%TET		
1	749	26.48
2	725	25.63
3	770	27.22
4	754	26.66
5	695	24.57
Mean	738.6	26.11
SD	29.23	1.03

Table 6 DTS of HEXA dental nanocomposites

1%HEXA		
Number of specimens	Load at Failure (N)	Diametral Tensile Strength (MPa)
1	890	31.46
2	1117	39.49
3	1125	39.77
4	964	34.08
5	895	31.64
Mean	998.2	35.29
SD	115.89	4.10
2%HEXA		
1	969	34.26
2	820	28.99
3	1109	39.21
4	855	30.23
5	1101	38.92
Mean	970.8	34.32
SD	134.35	4.75
4%HEXA		
1	781	27.61
2	761	26.90
3	785	27.75
4	793	28.04
5	745	26.34
Mean	773	27.33
SD	19.60	0.69
8%HEXA		
1	859	30.37
2	854	30.19
3	848	29.98
4	703	24.85
5	789	27.89
Mean	810.6	28.66
SD	66.46	2.35
16%HEXA		
1	670	23.69
2	693	24.50
3	627	22.17
4	670	23.69
5	629	22.24
Mean	657.8	23.26
SD	28.79	1.02

Table 7 DTS of OC dental nanocomposites

1%OC		
Number of specimens	Load at Failure (N)	Diametral Tensile Strength (MPa)
1	819	28.95
2	956	33.80
3	973	34.40
4	1020	36.06
5	866	30.62
Mean	926.8	32.77
SD	82.14	2.90
2%OC		
1	895	31.64
2	903	31.92
3	957	33.83
4	889	31.43
5	934	33.02
Mean	915.6	32.37
SD	28.91	1.02
4%OC		
1	676	23.90
2	901	31.85
3	848	29.98
4	721	25.49
5	870	30.76
Mean	803.2	28.40
SD	98.7	3.49
8%OC		
1	688	24.32
2	693	24.50
3	679	24.01
4	703	24.85
5	748	26.44
Mean	702.2	24.83
SD	27.03	0.96
16%OC		
1	662	23.40
2	795	28.11
3	720	25.45
4	686	24.25
5	666	23.55
Mean	705.8	24.95
SD	54.89	1.94

Table 8 DTS of HEXT dental nanocomposites

1%HEXT		
Number of specimens	Load at Failure (N)	Diametral Tensile Strength (MPa)
1	1229	43.45
2	1201	42.46
3	1056	37.33
4	1261	44.58
5	1316	46.53
Mean	1212.6	42.87
SD	97.42	3.44
2%HEXT		
1	1130	39.95
2	973	34.40
3	1239	43.80
4	1365	48.26
5	1164	41.15
Mean	1174.2	41.51
SD	144.17	5.10
4%HEXT		
1	729	25.77
2	831	29.38
3	774	27.36
4	936	33.09
5	917	32.42
Mean	837.4	29.61
SD	89.26	3.16
8%HEXT		
1	887	31.36
2	562	19.87
3	687	24.29
4	925	32.70
5	928	32.81
Mean	797.8	28.21
SD	165.05	5.84
16%HEXT		
1	864	30.55
2	660	23.33
3	776	27.43
4	848	29.98
5	669	23.65
Mean	763.4	26.99
SD	96.23	3.40

Table 9 DTS of OCT dental nanocomposites

1%OCT		
Number of specimens	Load at Failure (N)	Diametral Tensile Strength (MPa)
1	1543	54.55
2	1522	53.81
3	1360	48.08
4	1323	46.77
5	1064	37.62
Mean	1362.4	48.17
SD	192.80	6.82
2%OCT		
1	1074	37.97
2	1176	41.58
3	1183	41.82
4	1095	38.71
5	1013	35.81
Mean	1108.2	39.18
SD	71.76	2.54
4%OCT		
1	800	28.28
2	717	25.35
3	816	28.85
4	842	29.77
5	862	30.47
Mean	807.4	28.54
SD	55.86	1.97
8%OCT		
1	636	22.48
2	629	22.24
3	727	25.70
4	670	23.69
5	681	24.08
Mean	668.6	23.64
SD	39.36	1.39
16%OCT		
1	723	25.56
2	725	25.63
3	786	27.79
4	661	23.37
5	701	24.78
Mean	719.2	25.43
SD	45.36	1.60

CURRICULUM VITAE

Name: Piyanart Ekworapoj

Date of Birth: April 12, 1974

Nationality: Thai

University Education:

1991-1997 Doctor of Dental Surgery,
Mahidol University, Thailand

Work Experience:

1997- Now Lecturer, General Dentistry Department,
Faculty of Dentistry, Srinakarinwiroj University, Thailand

