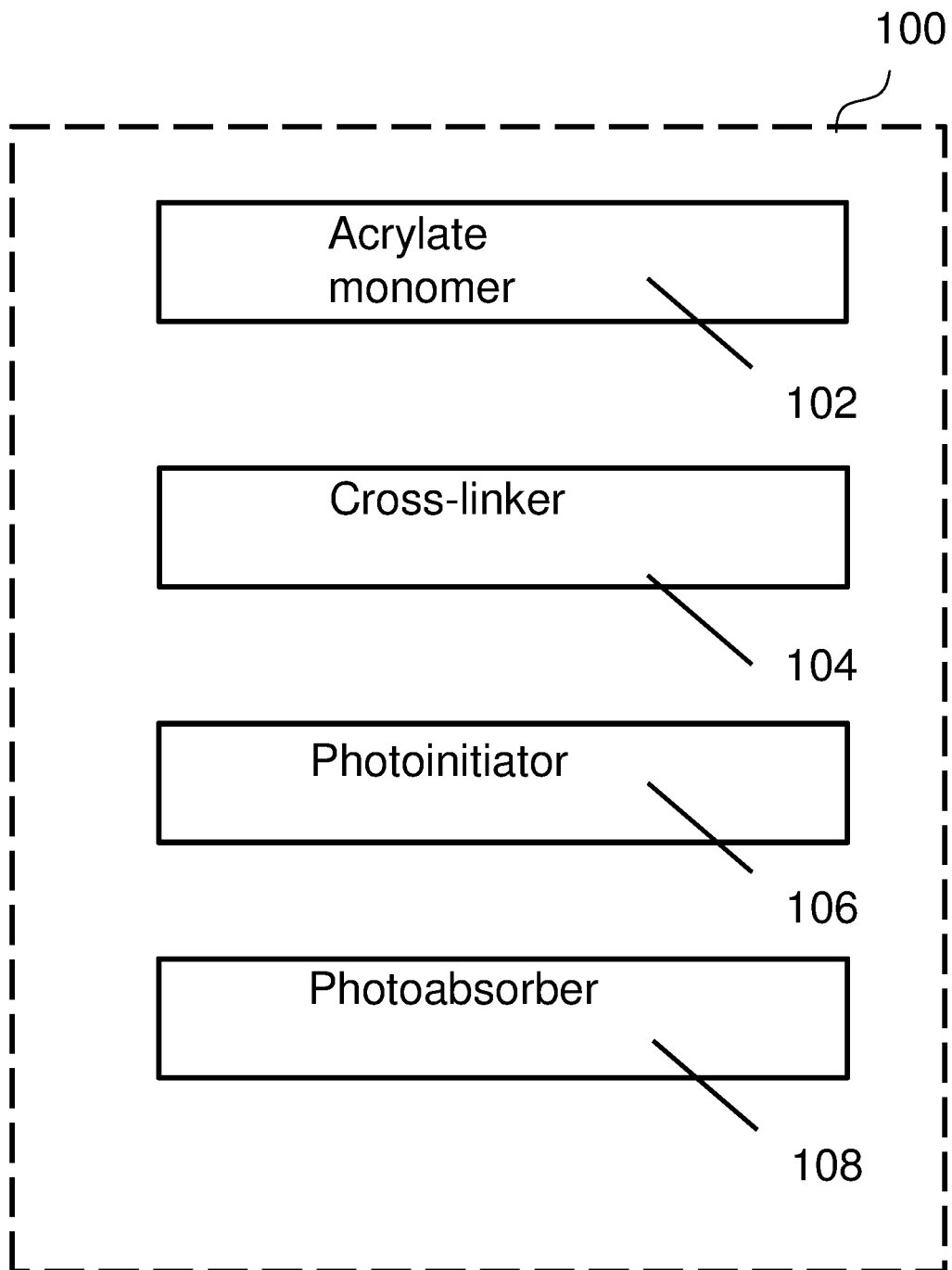


1/32
FIG. 1A



2/32
FIG. 1B

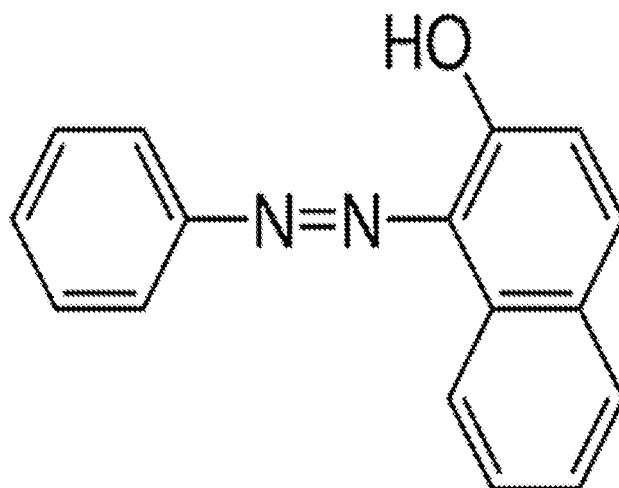
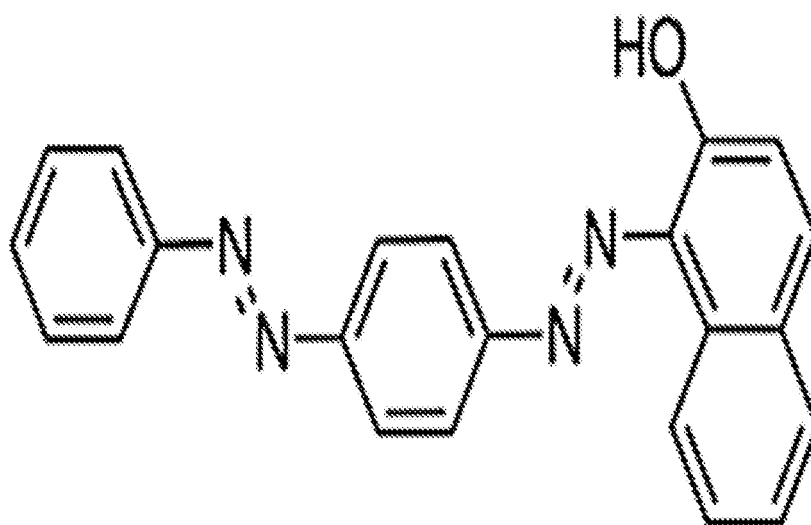
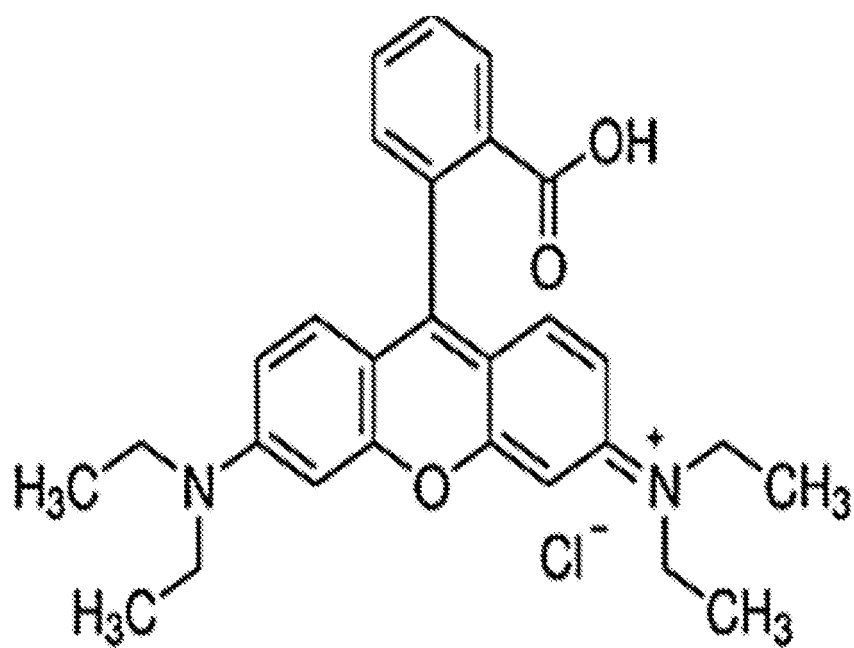


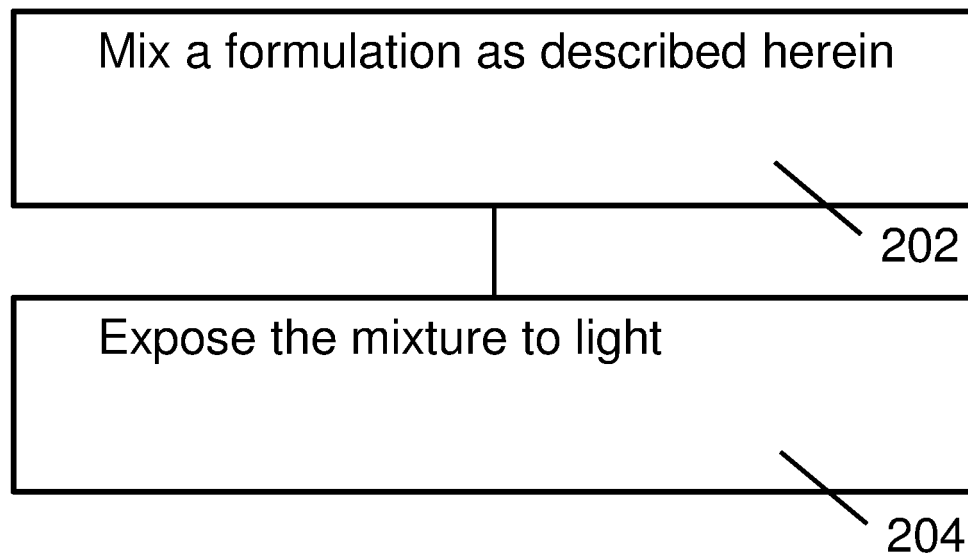
FIG. 1C



3/32
FIG. 1D

4/32

FIG. 2

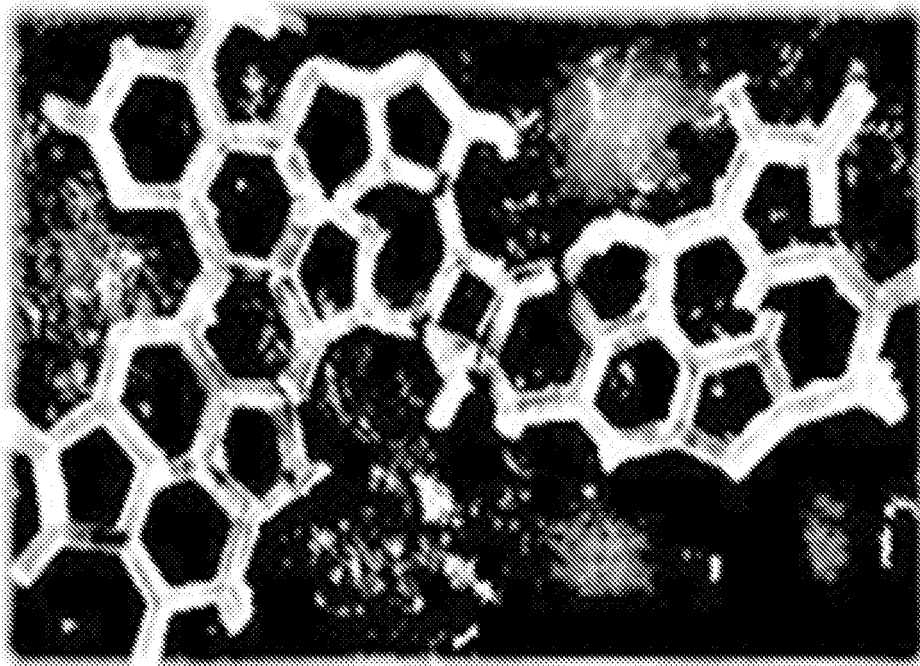


5/32
FIG. 3A



300a

FIG. 3B



300b

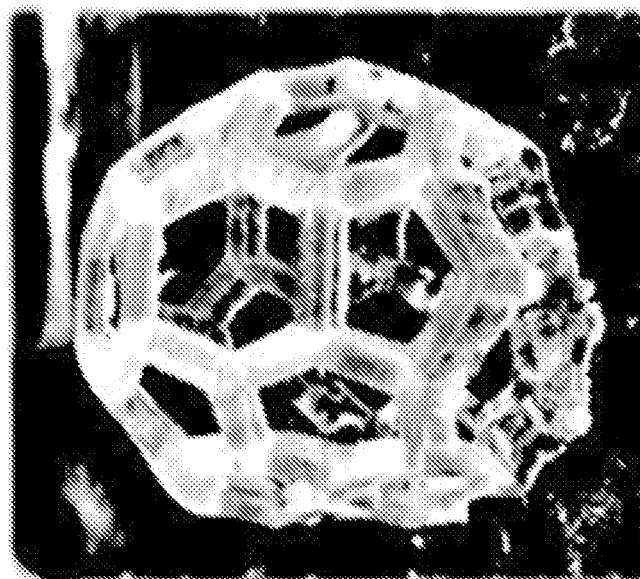
6/32
FIG. 3C

300c



FIG. 3D

300d



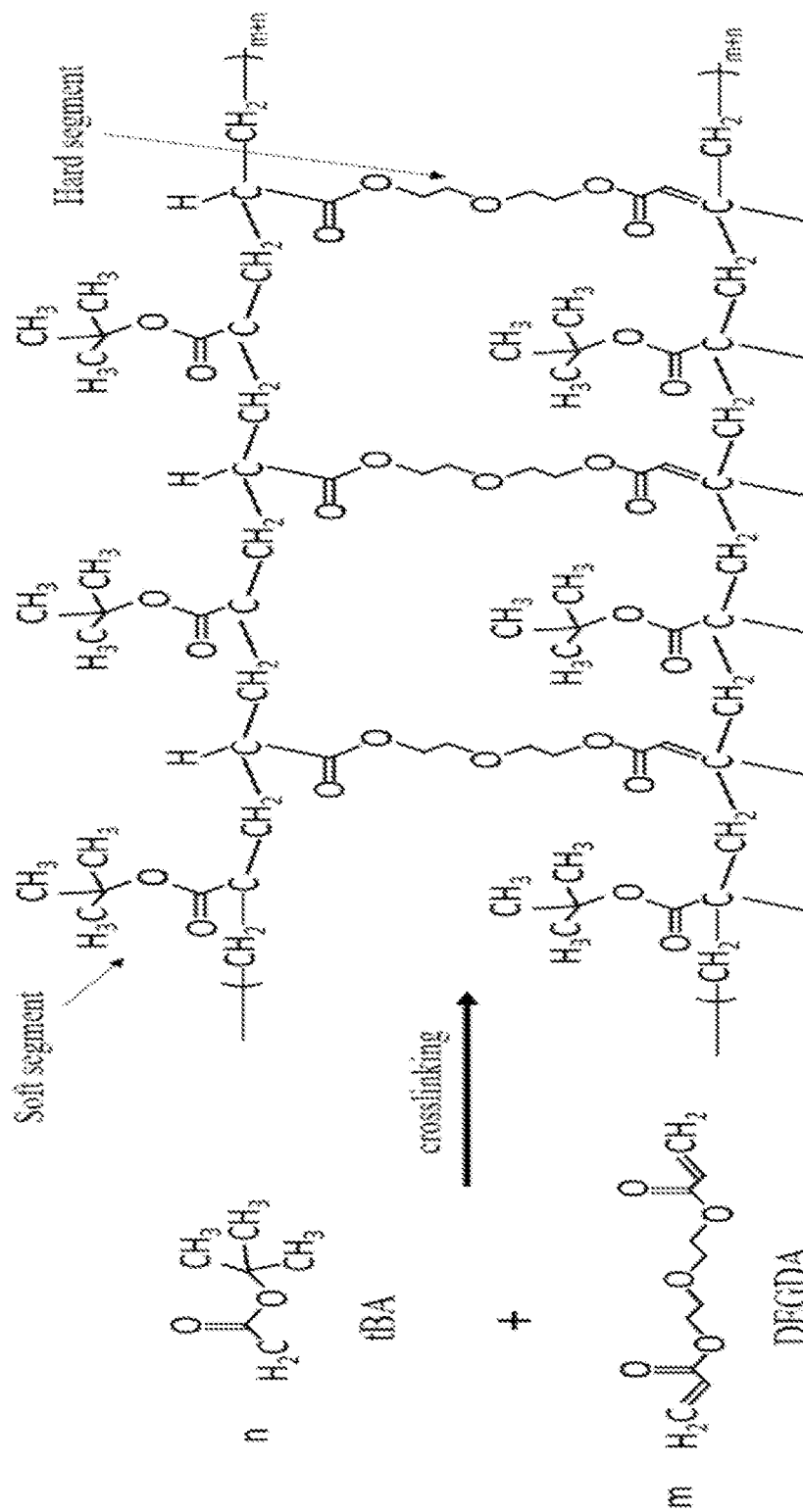
7/32
FIG. 3E

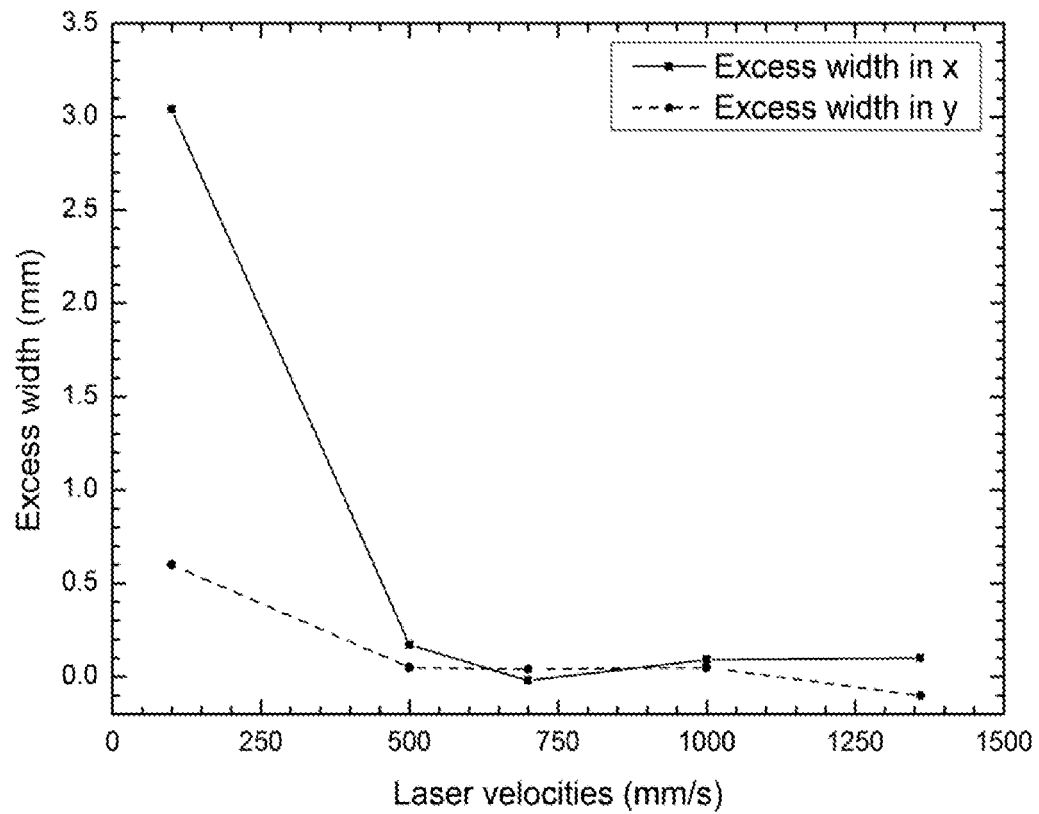
300e



FIG. 4

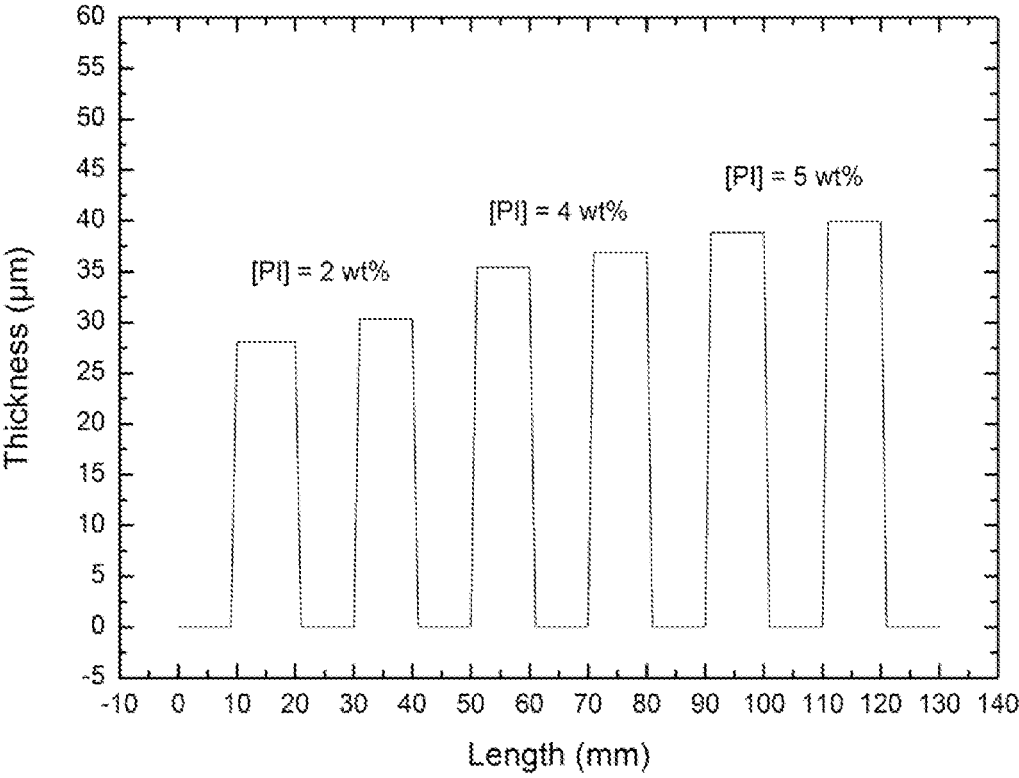
400

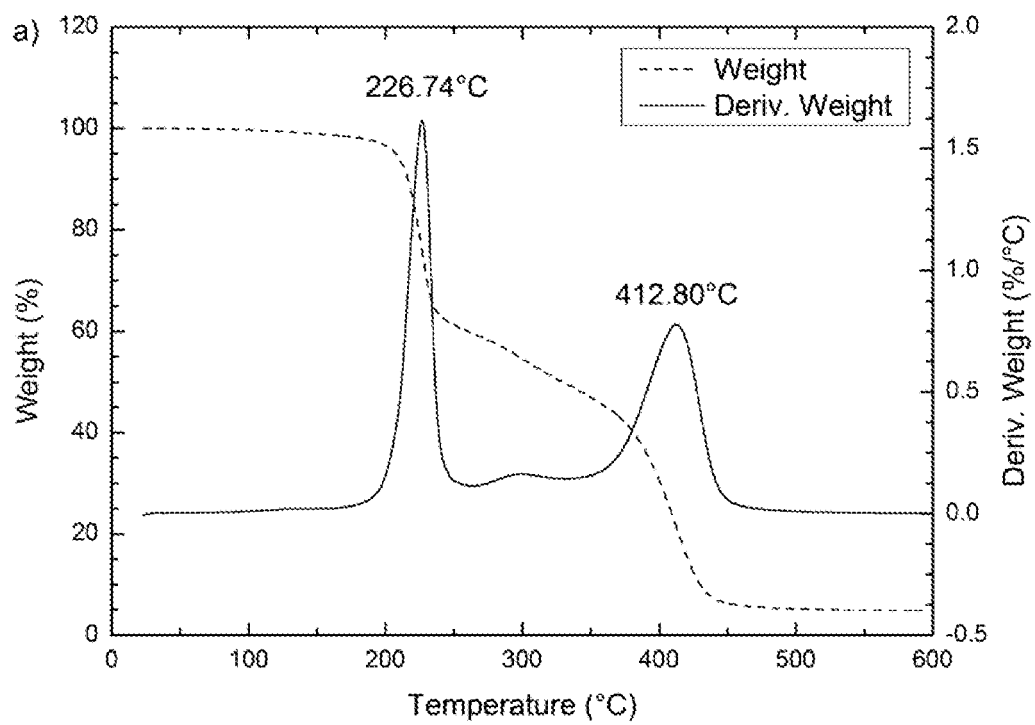


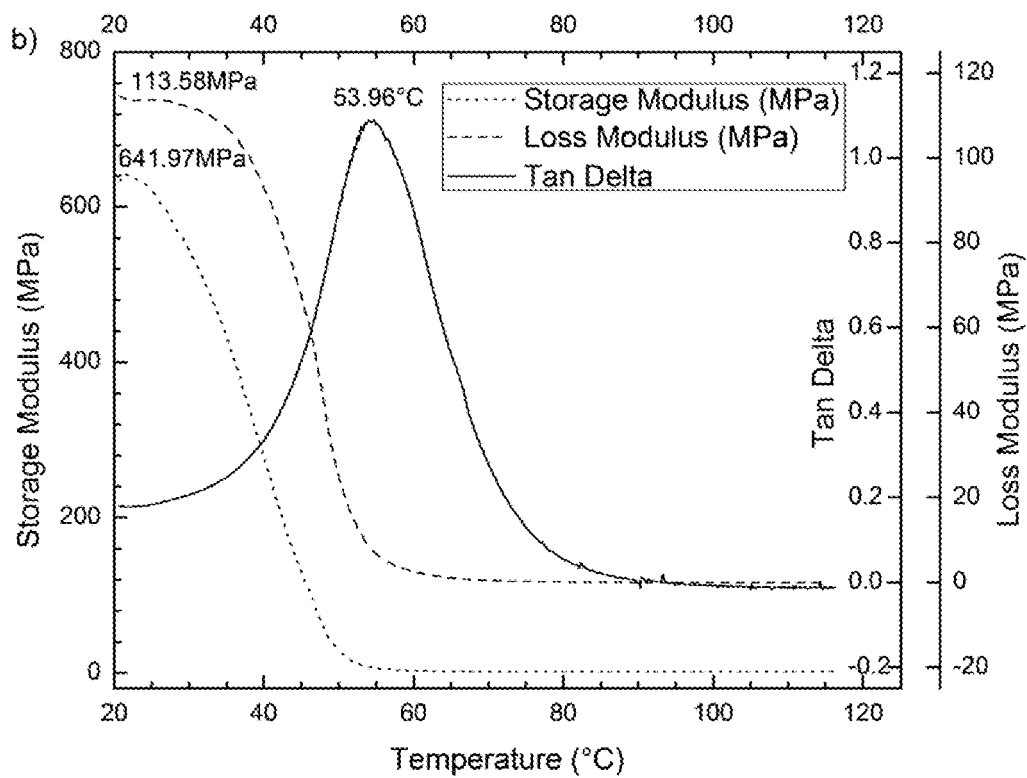
9/32
FIG. 5500

10/32
FIG. 6

600

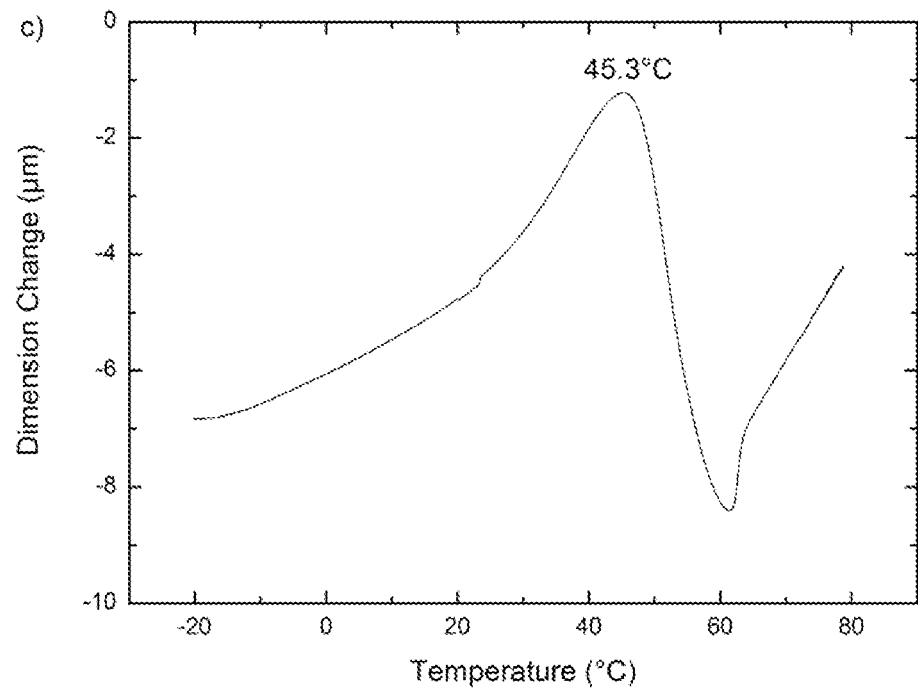


11/32
FIG. 7A700a

12/32
FIG. 7B700b

13/32
FIG. 7C

700c



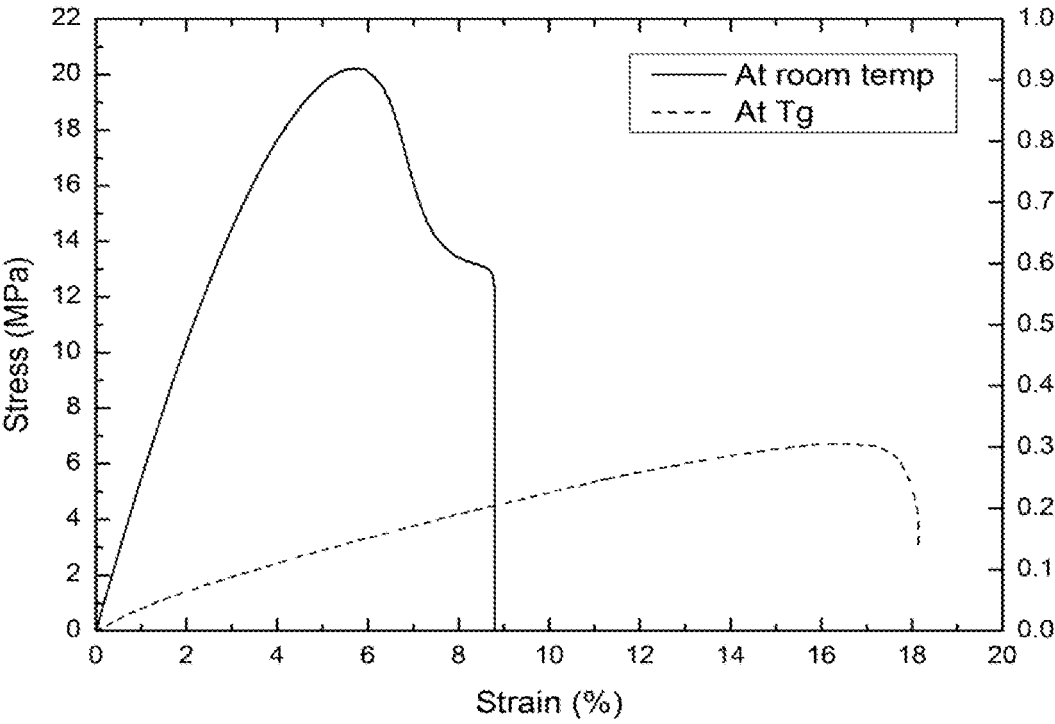
14/32
FIG. 8A

800a

Temperature	E, MPa	σ , MPa	ϵ , %
At r.t.p ($T < T_g$)	230 ± 41	20.2 ± 2.21	8.79 ± 0.95
At T_g	1.66 ± 0.10	0.302 ± 0.051	18.2 ± 0.343

FIG. 8B

800b



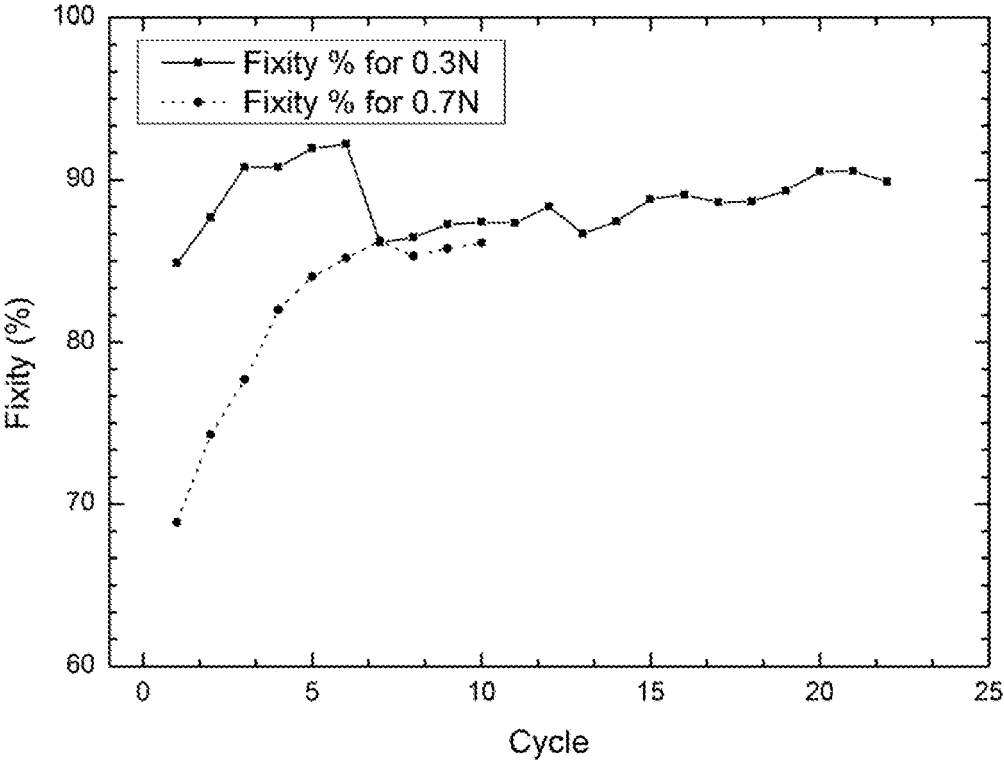
15/32
FIG. 8C

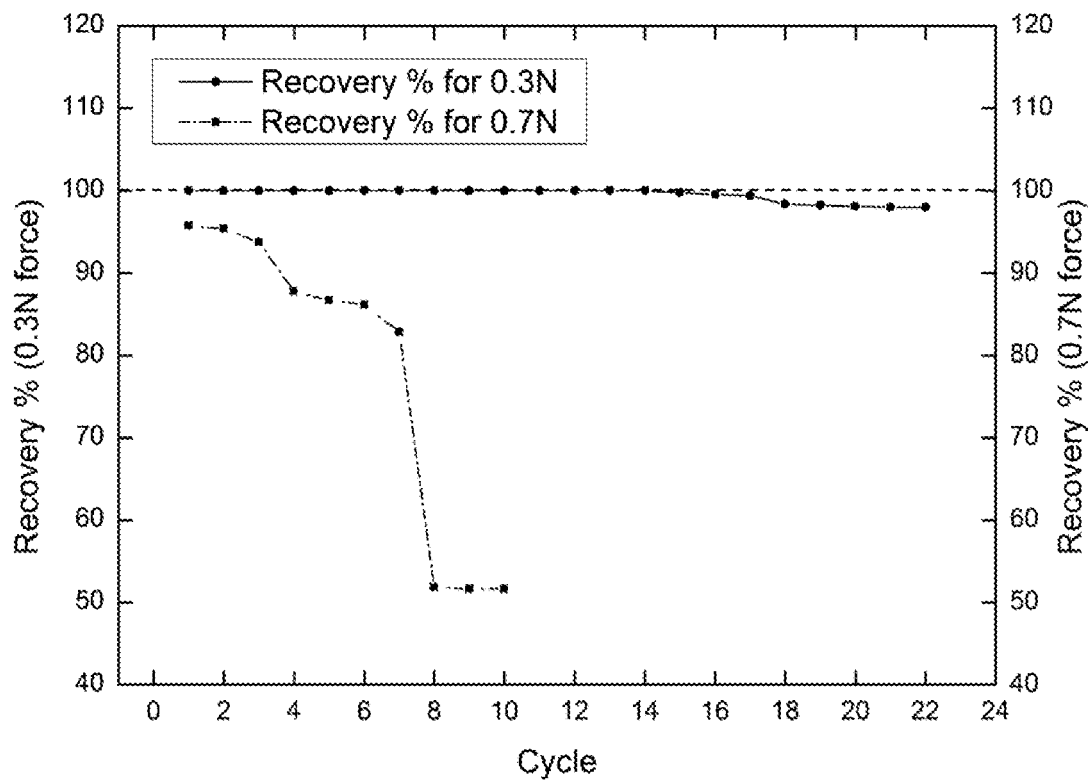
800c

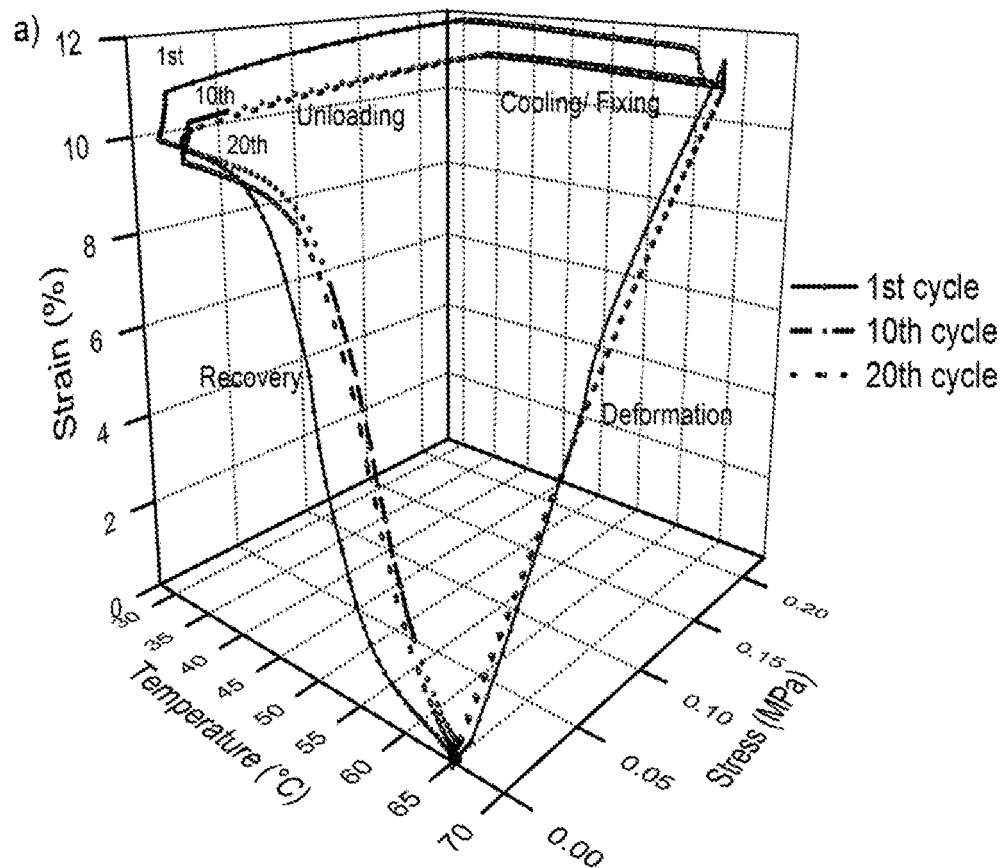
Properties		SLA-printed SMPs	Veriflex VF62 (thermoset commercial SMP)
Glass Transition Temp T_g ($^{\circ}$ C)		53.96	62
Tensile Strength (MPa)	At room temp.	20.2	23
	At T_g	0.302	1.0
Elastic Modulus (MPa)	At room temp.	230	1240
	At T_g	1.66	0.2
Elongation (%)	At room temp.	8.79	3.9
	At T_g	18.2	10.0

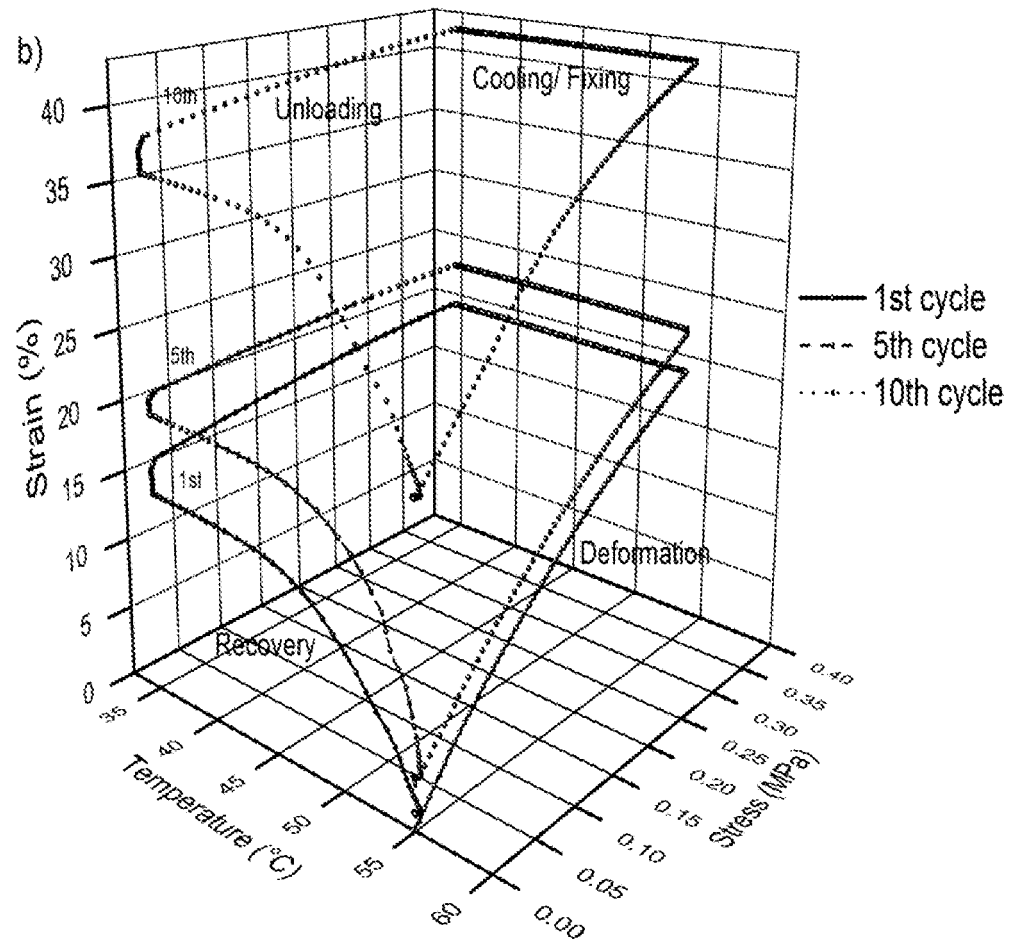
16/32
FIG. 9

900



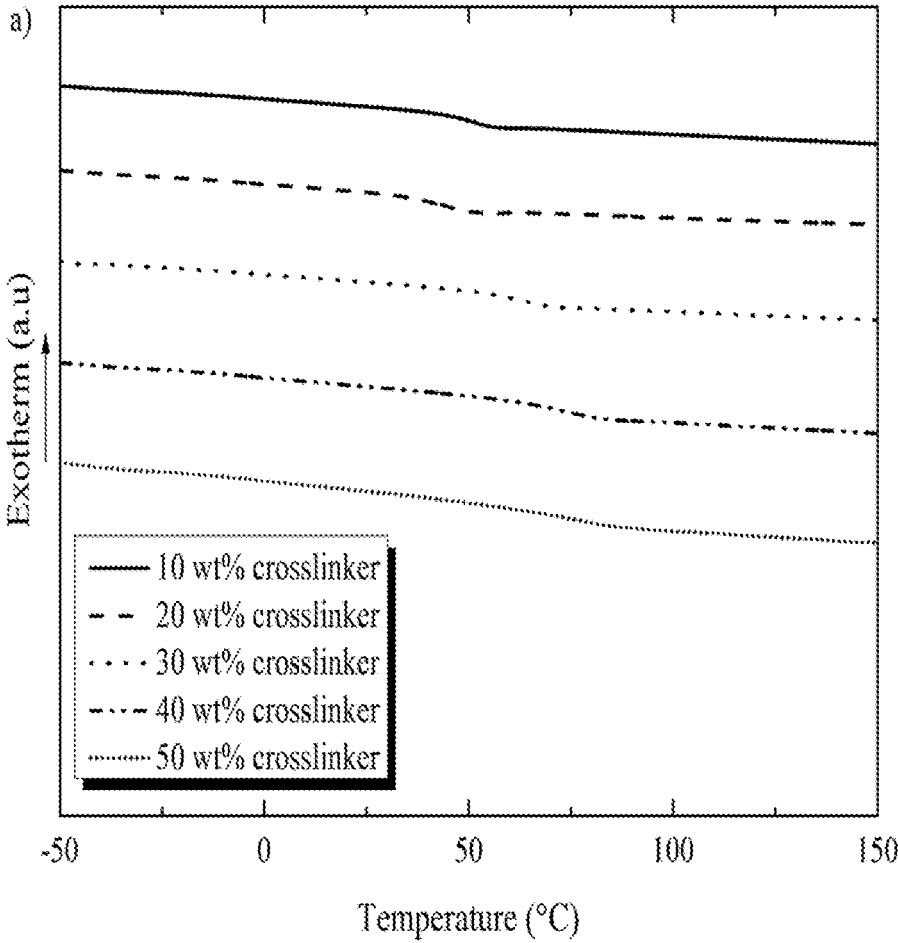
17/32
FIG. 101000

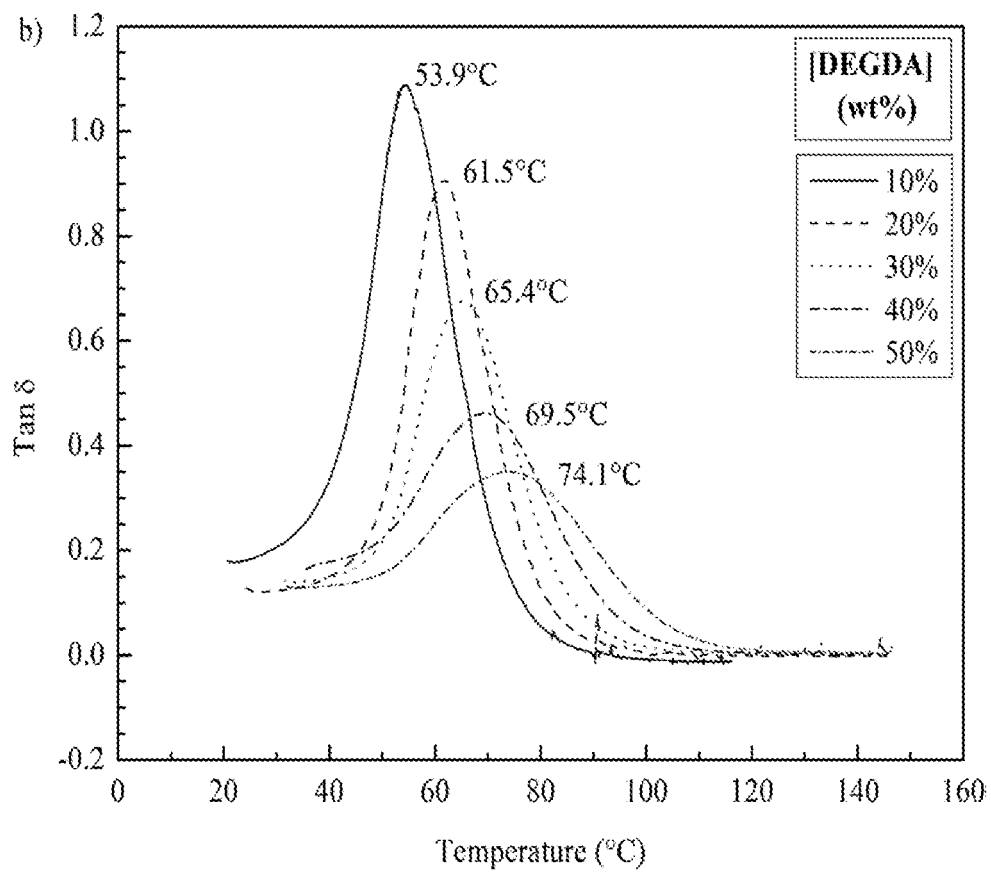
18/32
FIG. 11A1100a

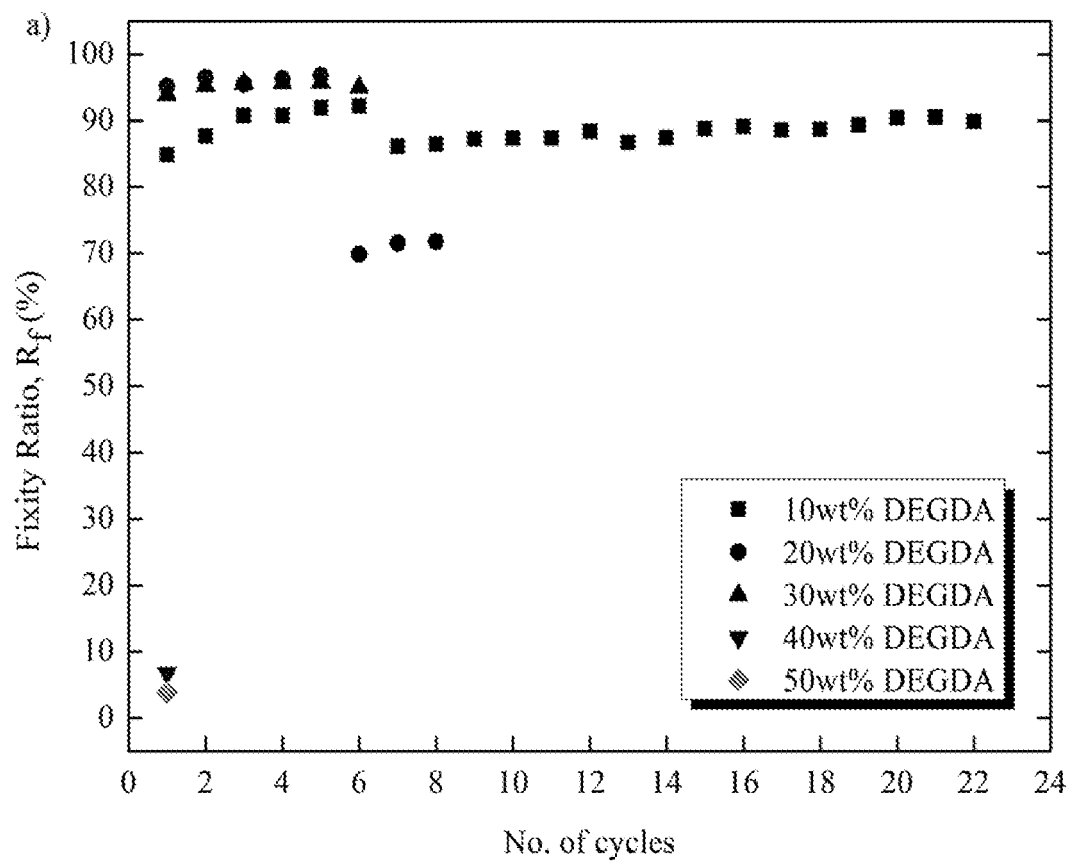
19/32
FIG. 11B1100b

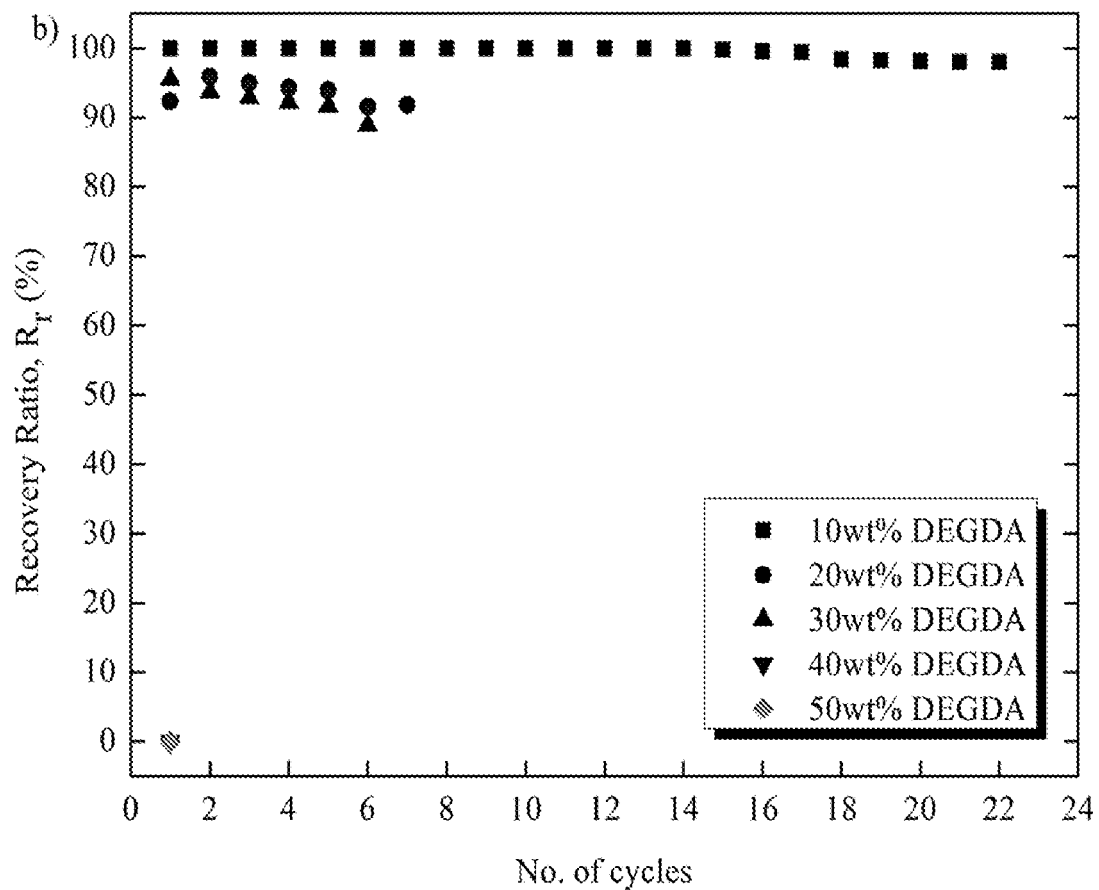
20/32
FIG. 12A

1200a

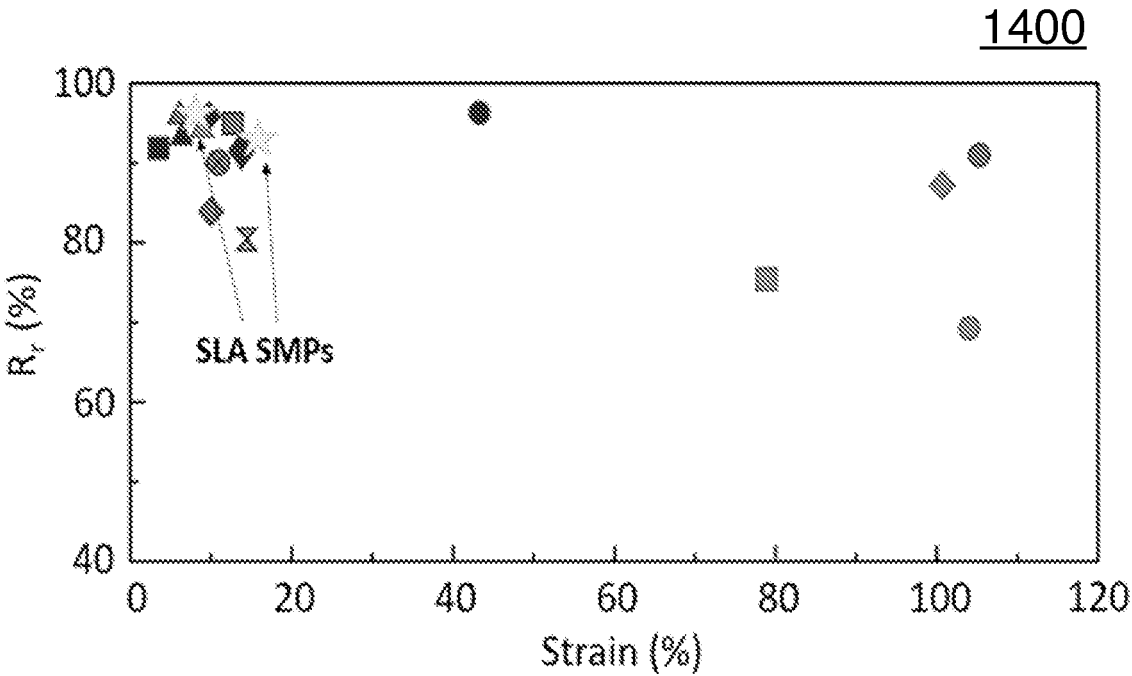


21/32
FIG. 12B1200b

22/32
FIG. 13A1300a

23/32
FIG. 13B1300b

24/32
FIG. 14



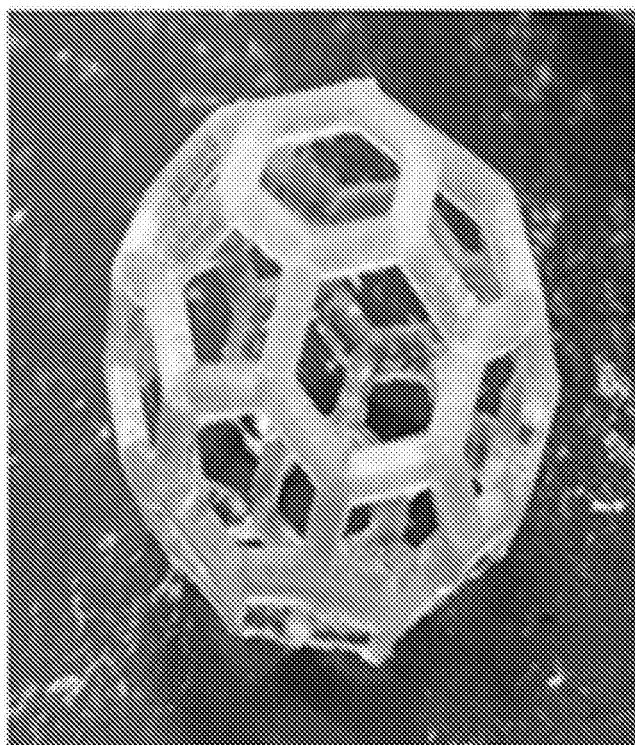
Typical Thermoset SMPs		
Epoxy based	Cyanate based	Polyurethane
■ Commercial DP7AR TEMBO®	■ Cyanate Blend	■ Polyol
▲ SMEP TEMBO® (CTD Inc.)	▲ BACE/ CTBN Copolymer	▲ Soybean Oil
● Monomer E44	● Ester SMP (CRG Inc.)	● Dextrin
◆ Phenolic	◆ Rubber	◆ Castor Oil
● Anhydride	◆ Polybutadiene	
⊗ Vegetable Oil		★ This work

25/32
FIG. 15A



1500a

FIG. 15B



1500b

26/32
FIG. 15C

1500c

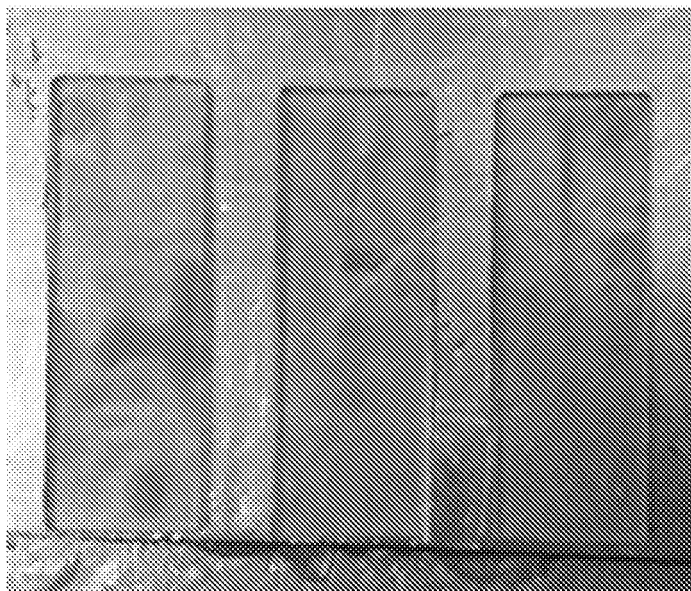
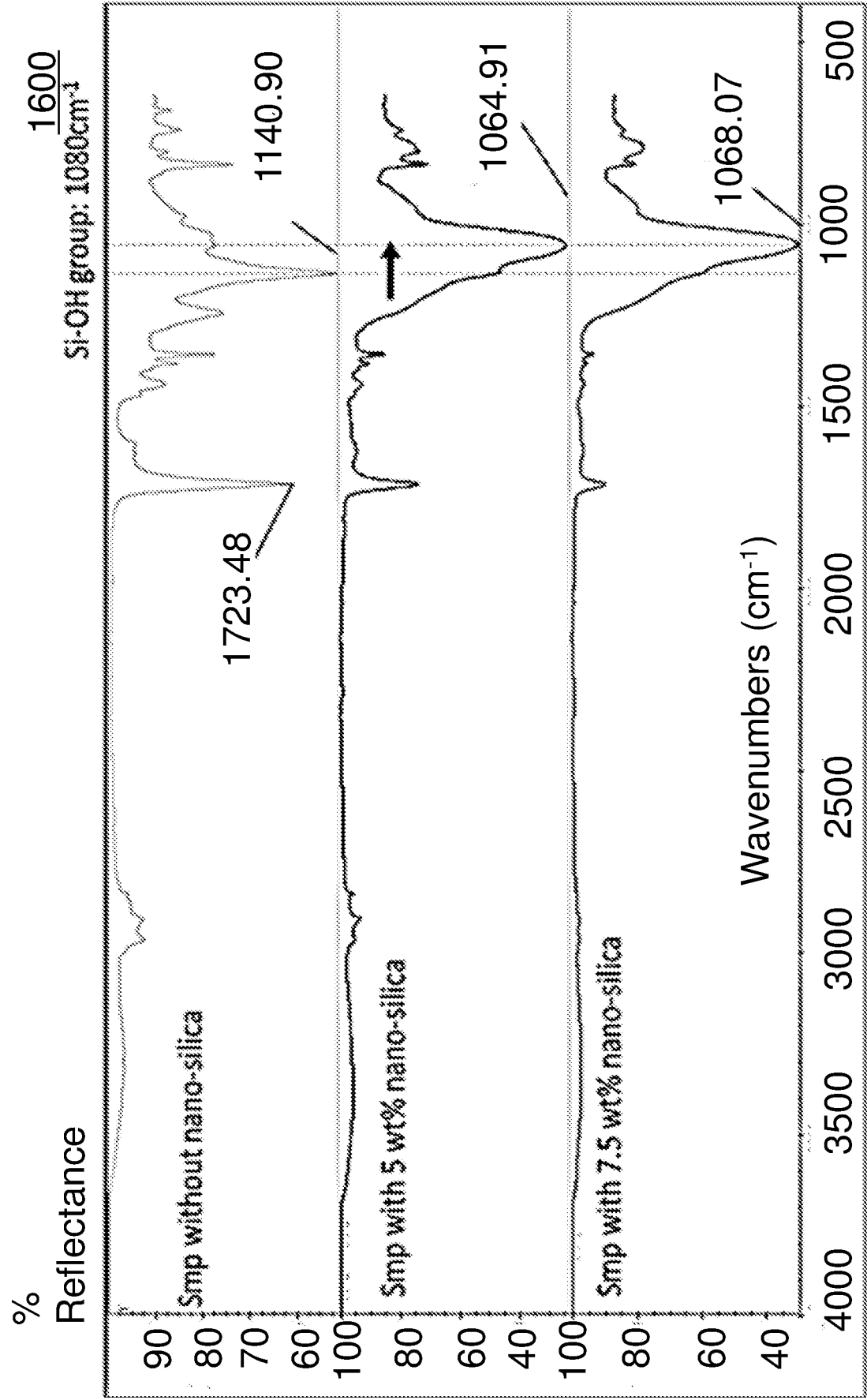


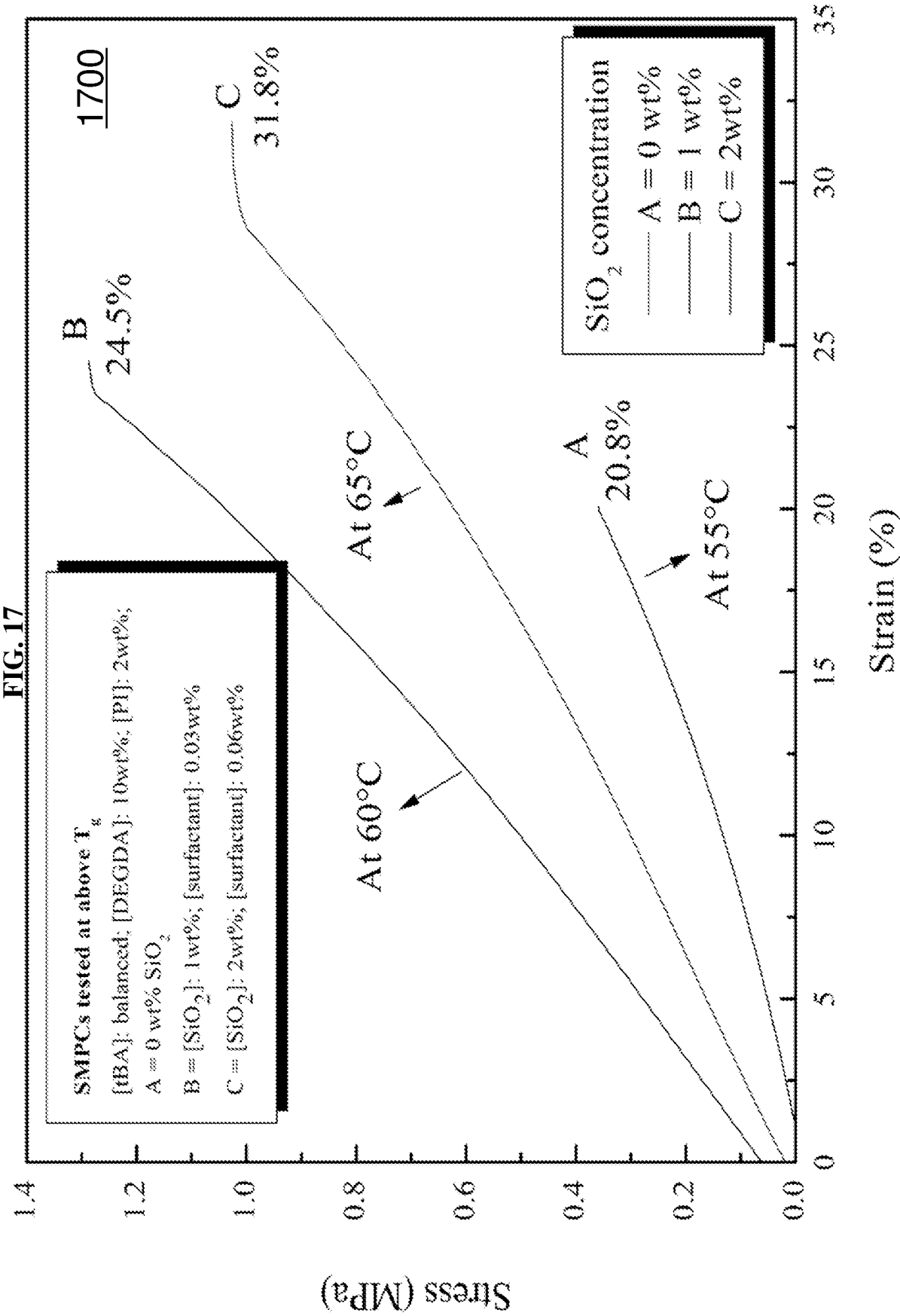
FIG. 15D

1500d



FIG. 16





29/32
FIG. 18A

1800a

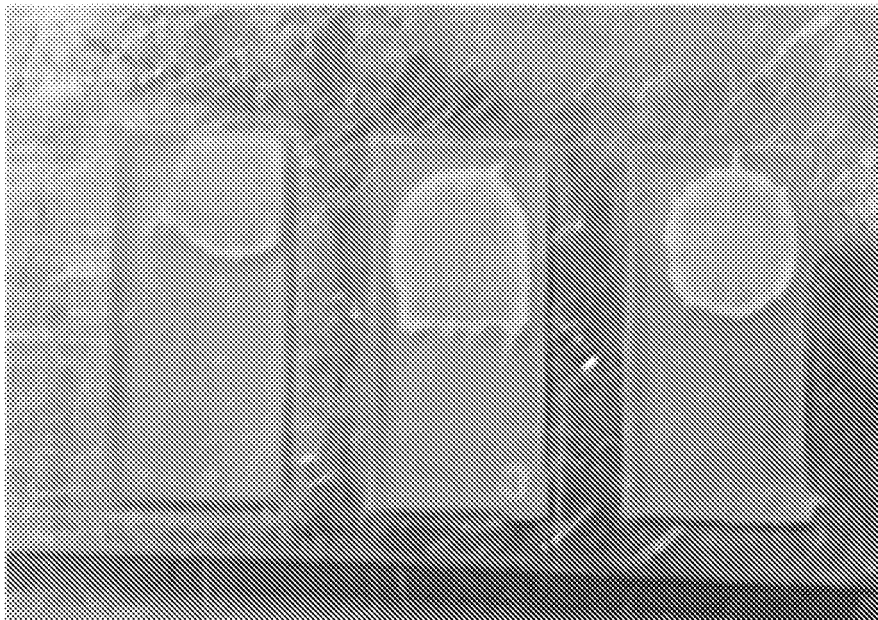


FIG. 18B

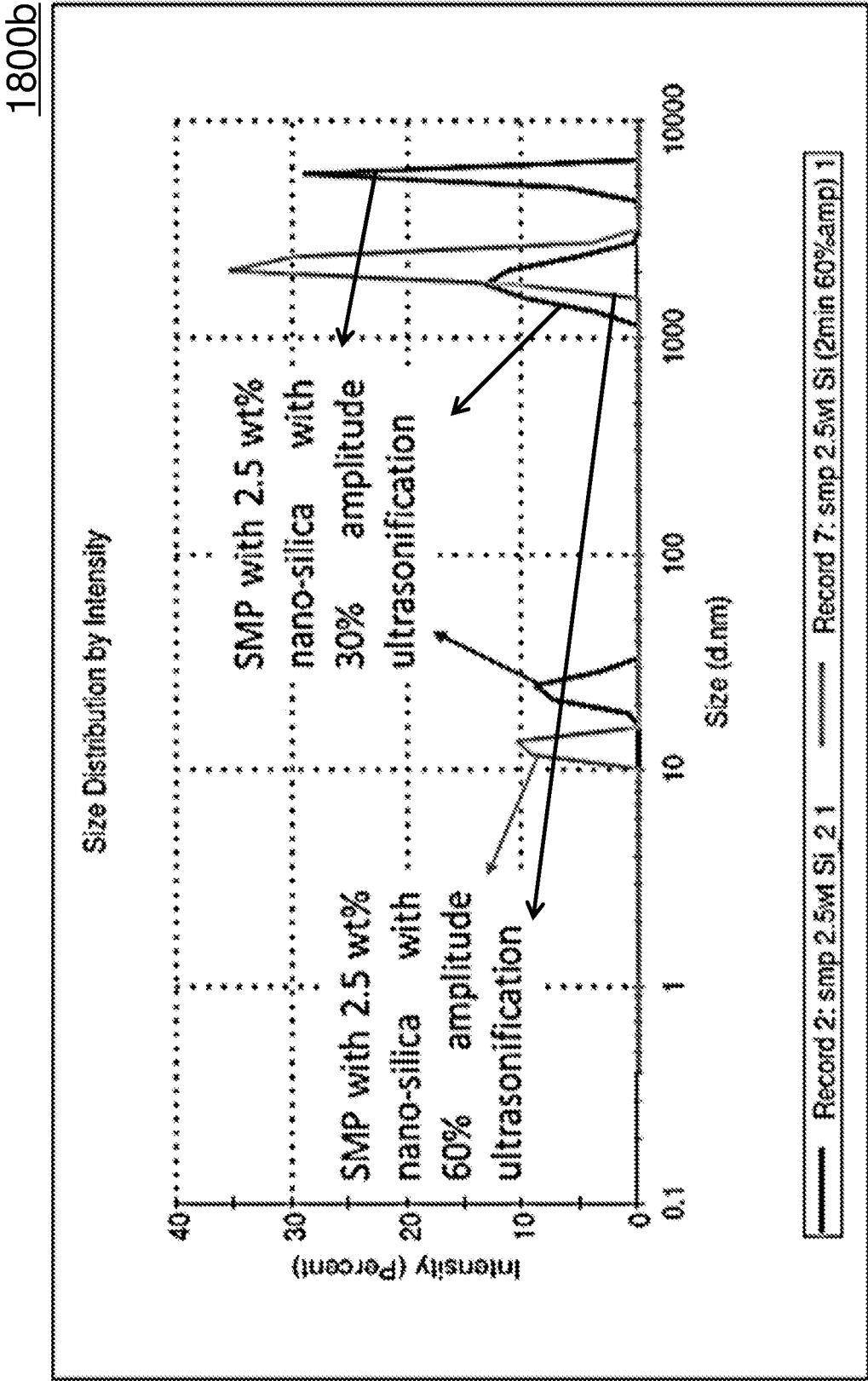
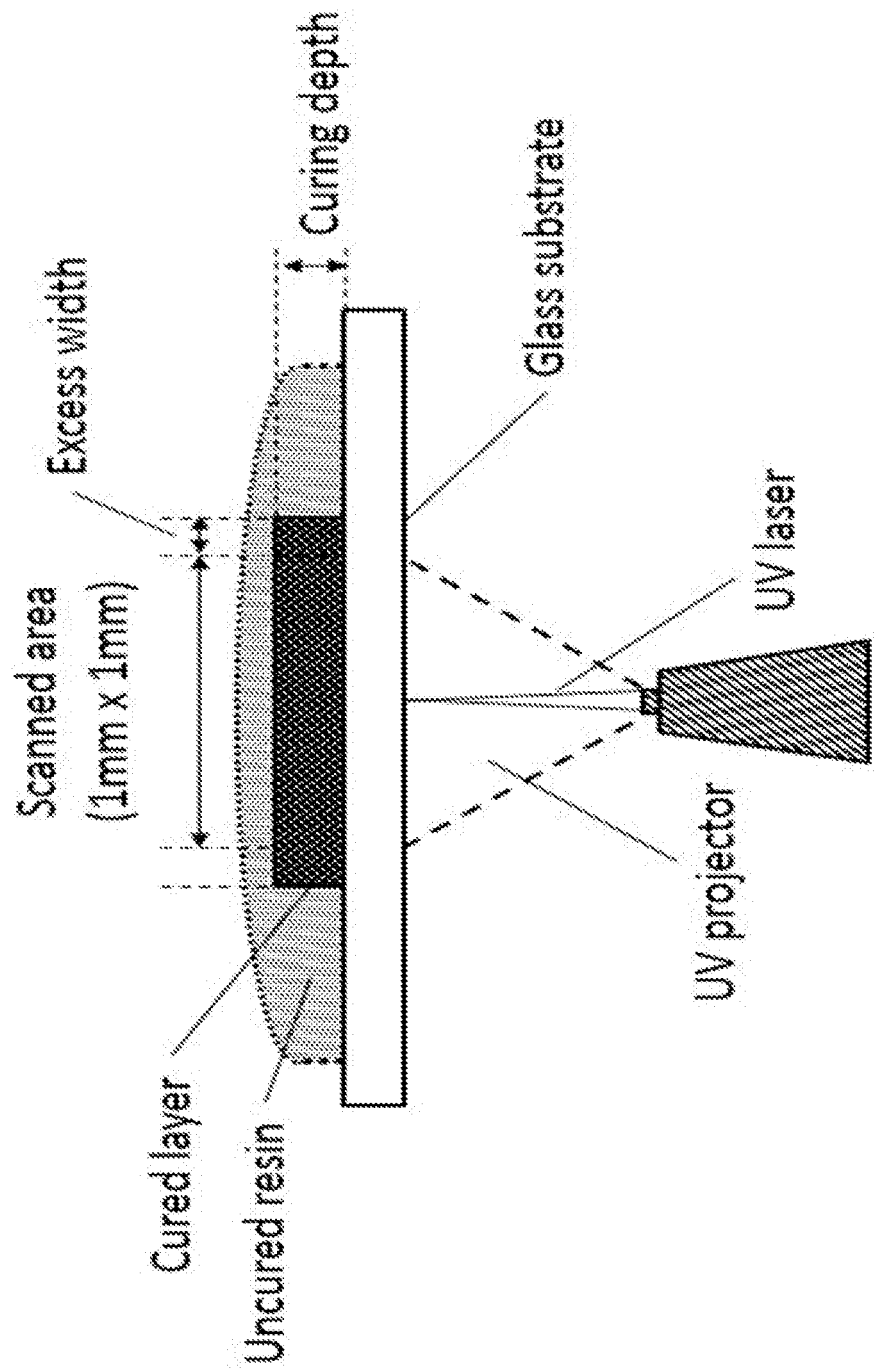


FIG. 19

1900



32/32
FIG. 20A

2000a



FIG. 20B

2000b

