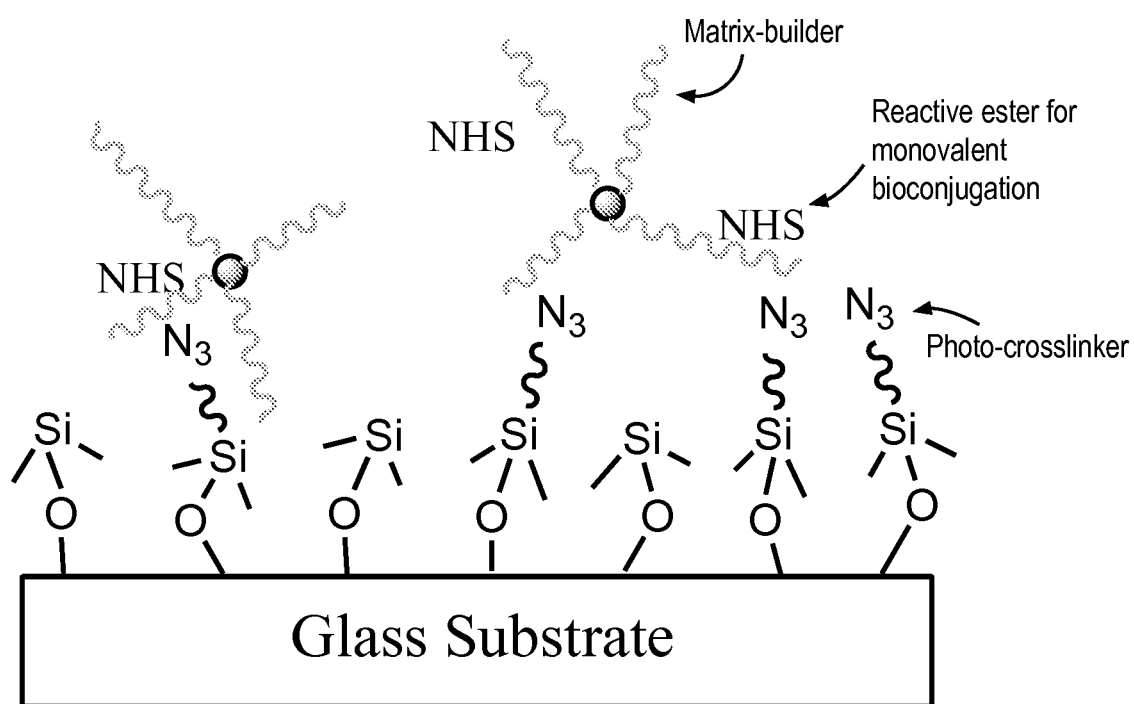


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*FIG. 1*

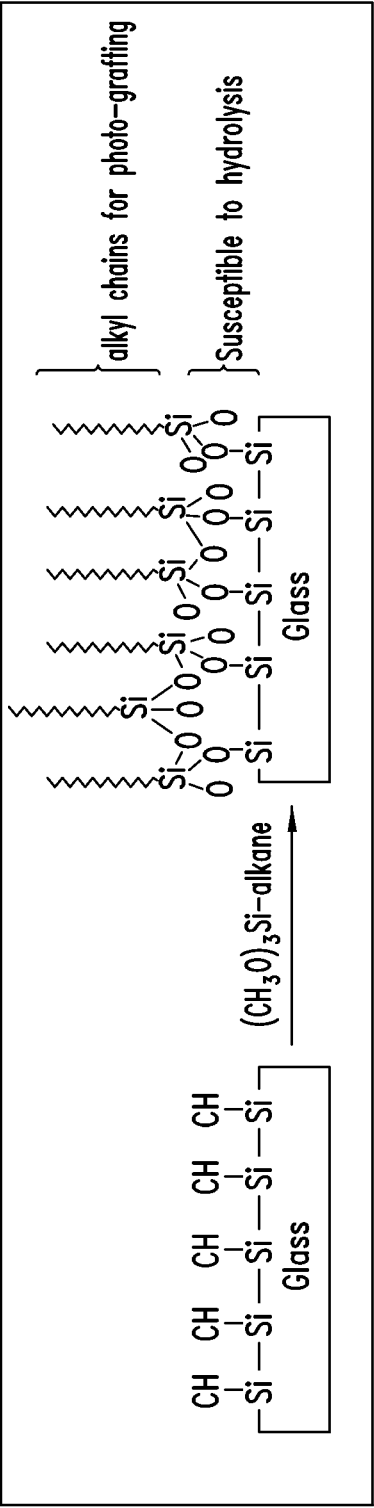


FIG. 2

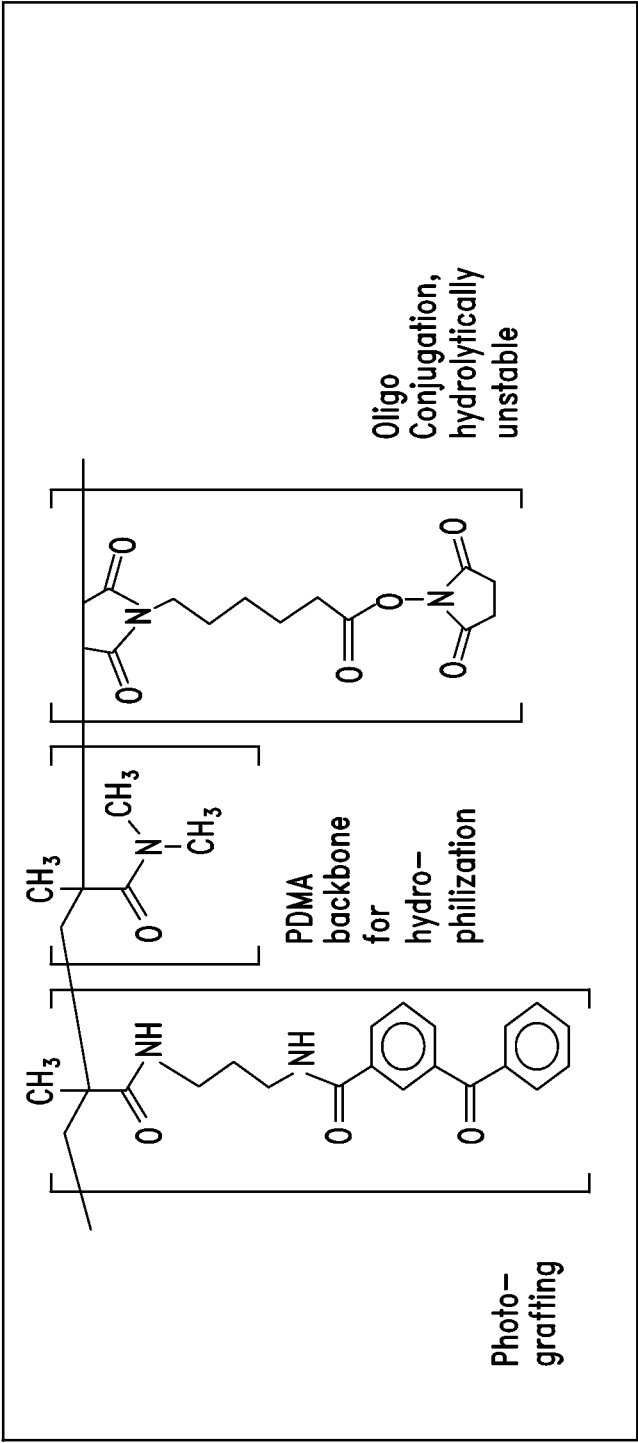
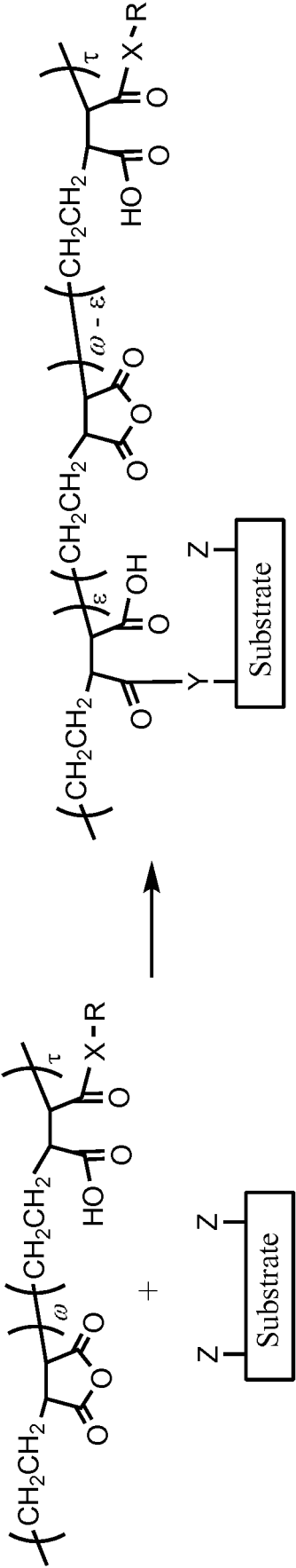


FIG. 3



Where, $\text{R} = -\text{H}$, $-\text{C}_n\text{H}_{2n+1}$, $-(\text{CH}_2\text{CH}_2\text{O})_\delta-\text{H}$, or $-\text{N}(\text{C}_n\text{H}_{2n+1})_2$

$\text{Z} = -\text{NH}_2$

$\text{X} = \text{Y} = -\text{N}-$

FIG. 4

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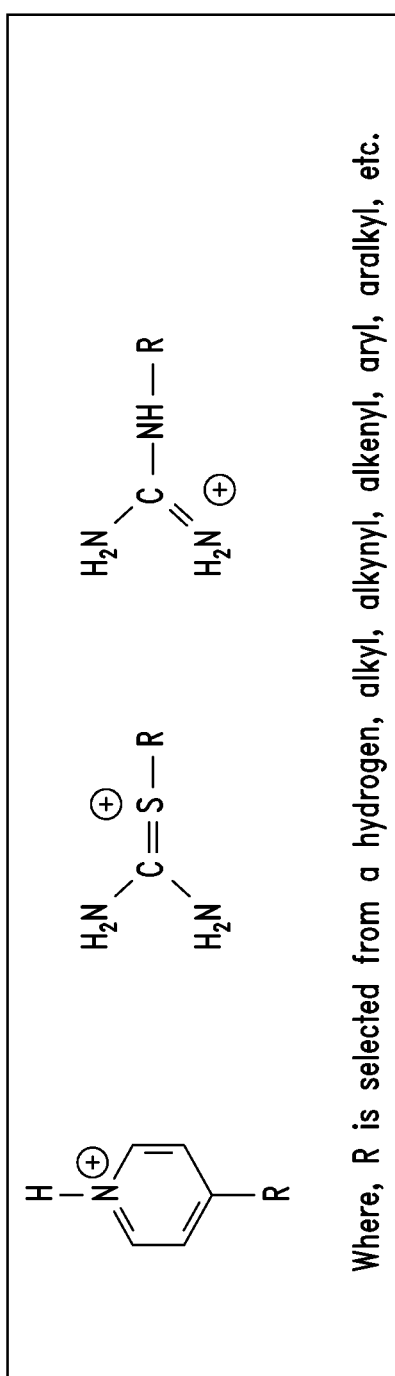
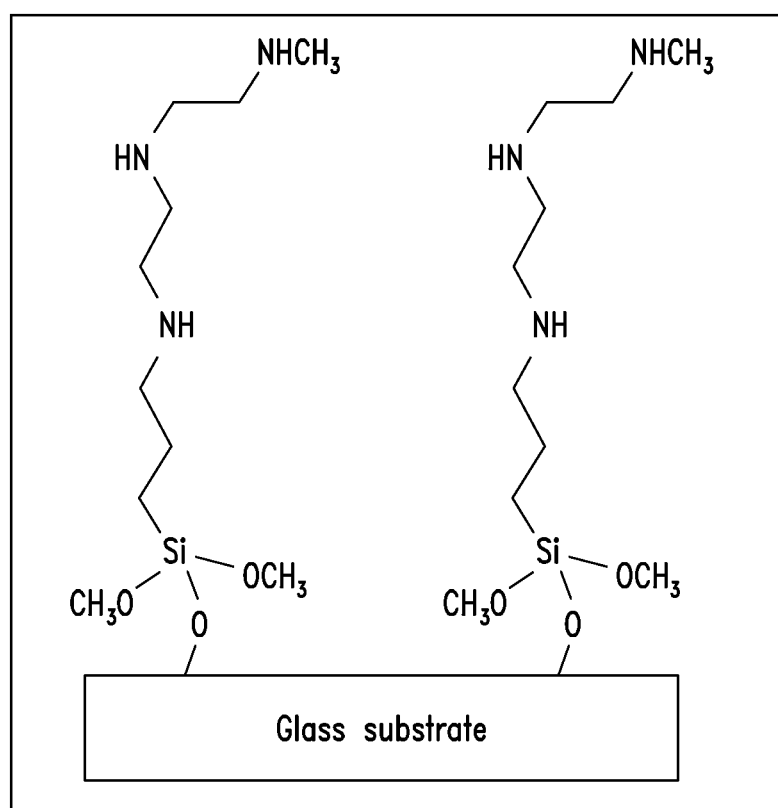


FIG. 5

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*FIG. 6*

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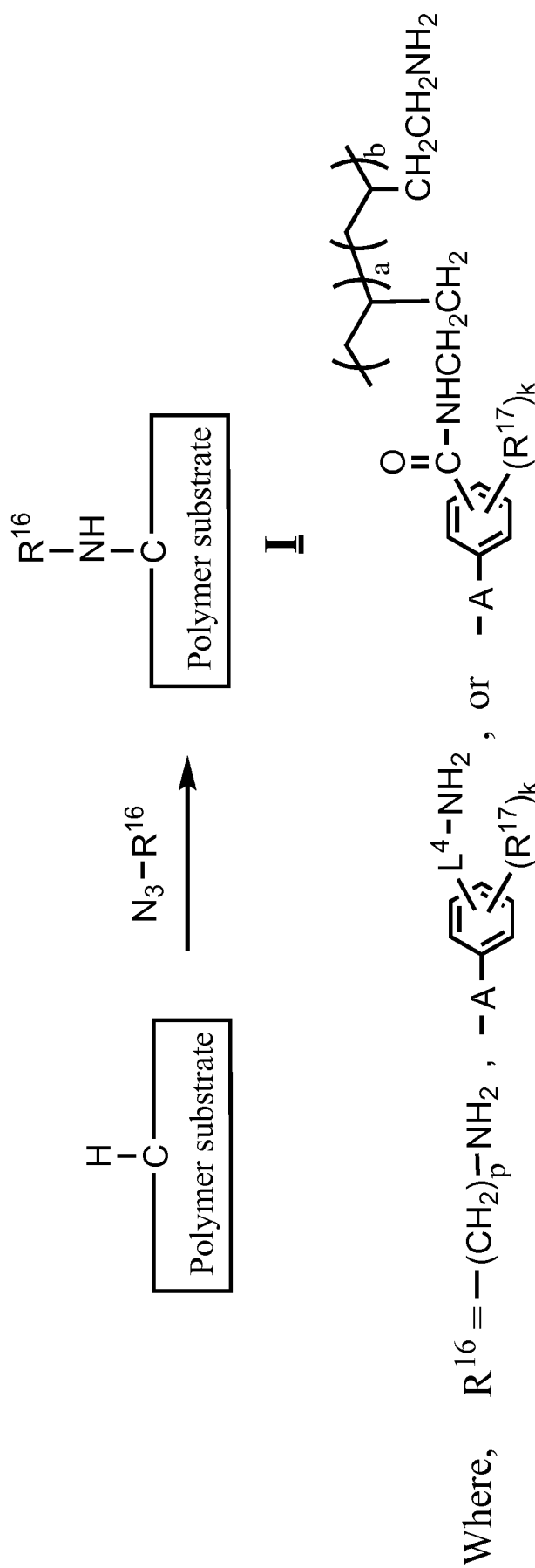
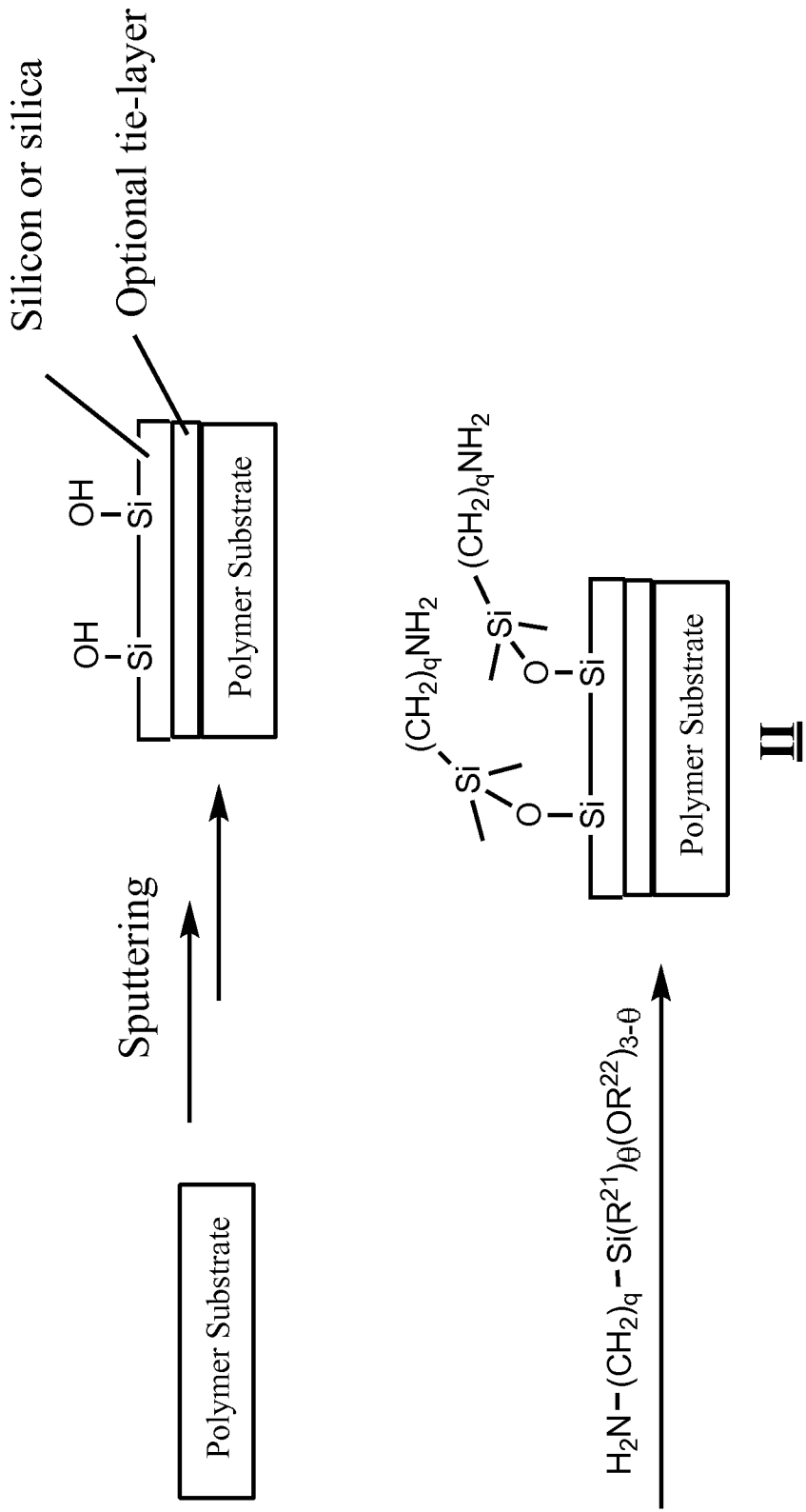


FIG. 7



Where, $q = 1$ to 6 and $\theta = 0$ to 2

FIG. 8

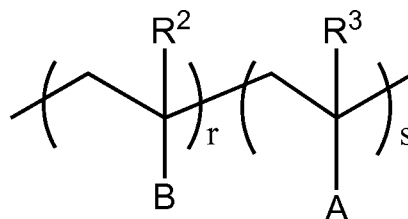


III

Where,  = silica particle
 θ = zero to 2 and $q = 1$ to 6
 $R^{21} = CH_3, C_2H_5, \text{ iso-}C_3H_7, C_4H_9, \text{ or } C(CH_3)_3$
 $R^{22} = CH_3 \text{ or } C_2H_5$

FIG. 9

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**IV**

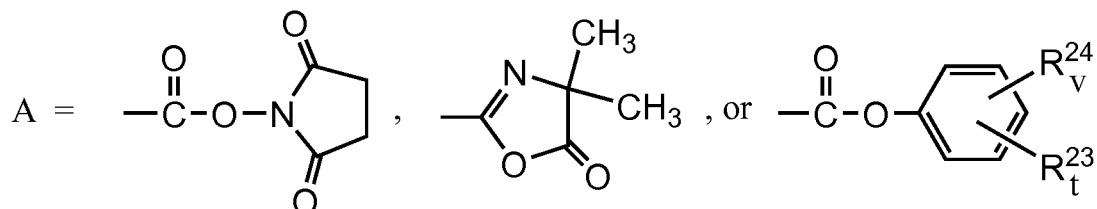
Where, $r + s = 100 \text{ mol}\%$

R^2 and R^3 are independently H or CH_3

$B = -\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-(\text{OCH}_2\text{CH}_2)_n-\text{OH}$, $-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-(\text{OCH}_2\text{CH}_2)_n-\text{OCH}_3$, or $-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\text{NR}^6\text{R}^7$

$n = 1 \text{ to } 2000$

R^6 and R^7 are independently, H, CH_3 , CH_2OH , C_2H_5 , $\text{C}_2\text{H}_4\text{OH}$, C_3H_7 , or C_4H_9



$t + v = 5$

$R^{23} = -\text{Cl}, -\text{Br}, -\text{F}, -\text{NO}_2, -\text{CN}, -\text{CF}_3$, or $-\overset{\oplus}{\text{N}}\text{R}^{18}\text{R}^{19}\text{R}^{20}$

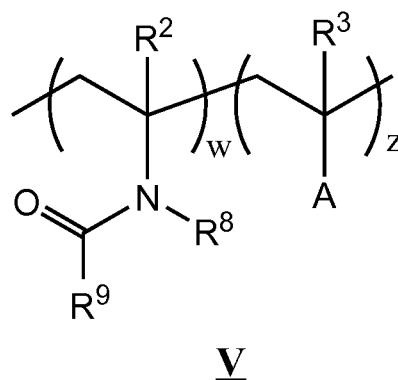
$R^{24} = -\text{H}, -\text{NCS}, -\text{NCO}, -\text{N(H)C(S)NH-PEG}, -\text{N(H)C(O)NH-PEG}, -\text{CONH-PEG}, -\text{SO}_2\text{NH-PEG}, \text{CO}_2\text{H}, -\text{SO}_3\text{H}$, and their salts

R^{18} , R^{19} , and R^{20} are independently C_1 to C_6 alkyl or halogenated alkyl groups

PEG can be capped by a methoxy group.

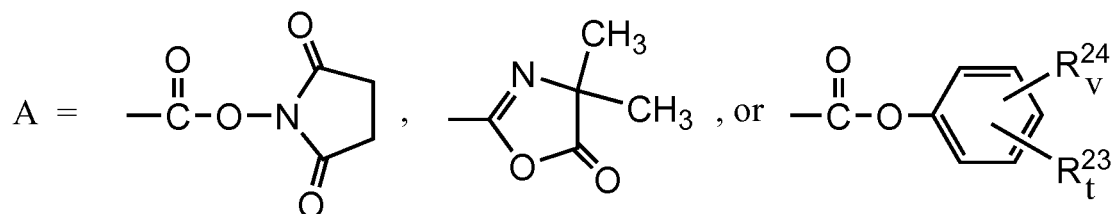
FIG. 10

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Where, $w + z = 100 \text{ mol\%}$

R^2, R^3, R^8, R^9 are independently H, CH_3 , C_2H_5



$t + v = 5$

$R^{23} = -\text{Cl}, -\text{Br}, -\text{F}, -\text{NO}_2, -\text{CN}, -\text{CF}_3$, or $-\text{NR}^{18}\text{R}^{19}\text{R}^{20\oplus}$

$R^{24} = -\text{H}, -\text{NCS}, -\text{NCO}, -\text{N(H)C(S)NH-PEG}, -\text{N(H)C(O)NH-PEG}, -\text{CONH-PEG},$
 $-\text{SO}_2\text{NH-PEG}, \text{CO}_2\text{H}, -\text{SO}_3\text{H},$ and their salts

R^{18}, R^{19} , and R^{20} are independently C_1 to C_6 alkyl or halogenated alkyl groups

PEG can be capped by a methoxy group.

FIG. 11

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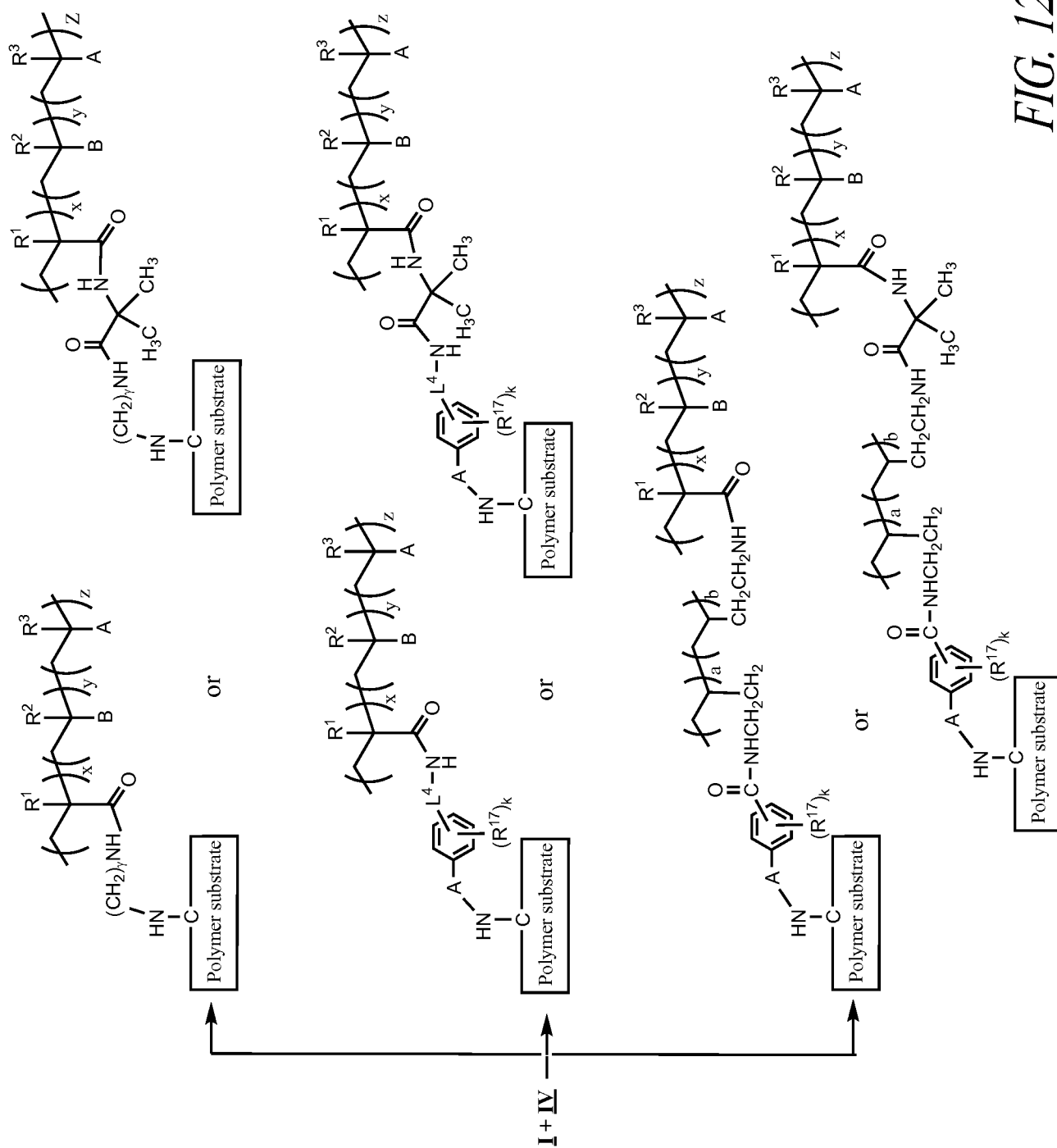
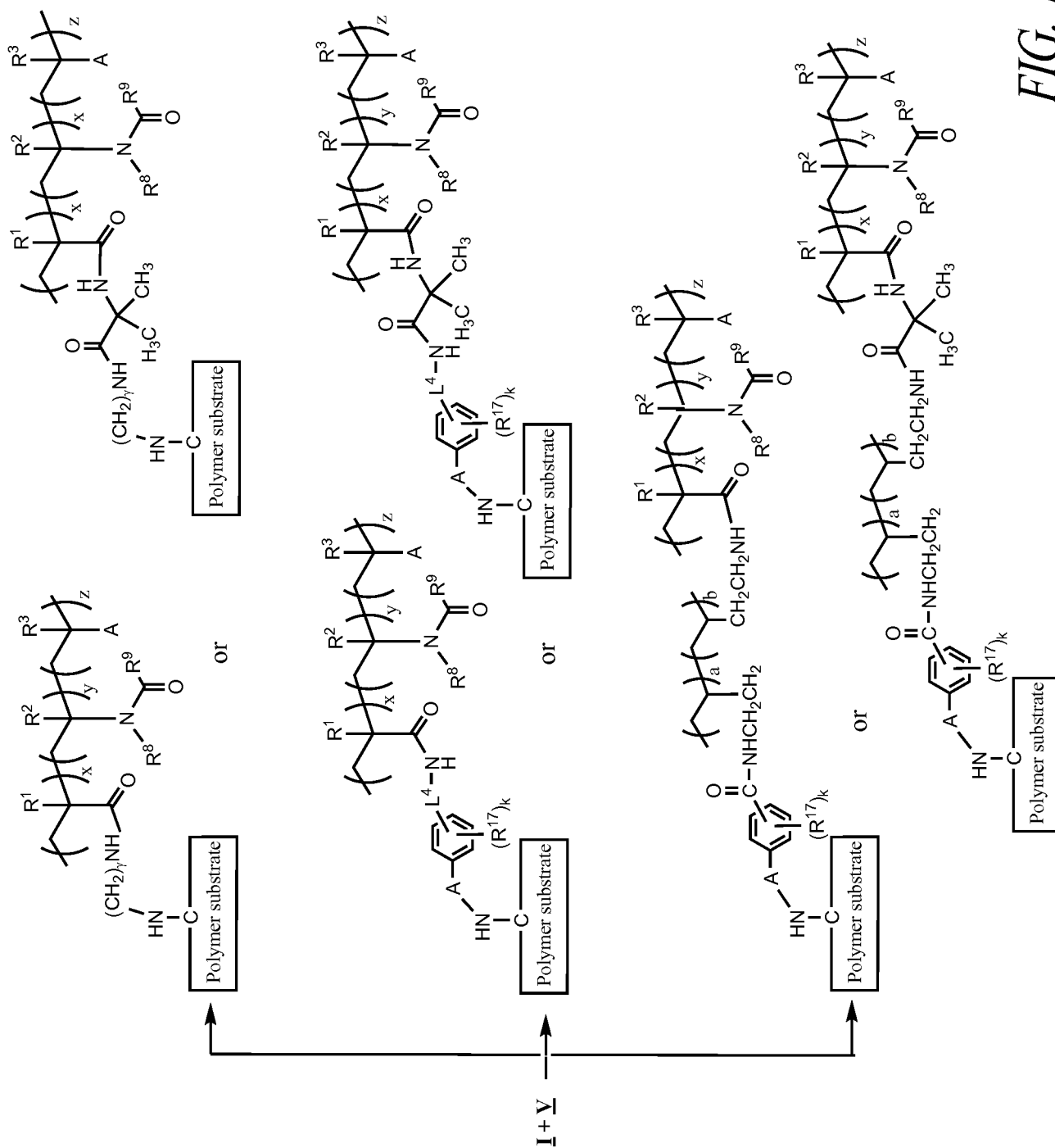


FIG. 12



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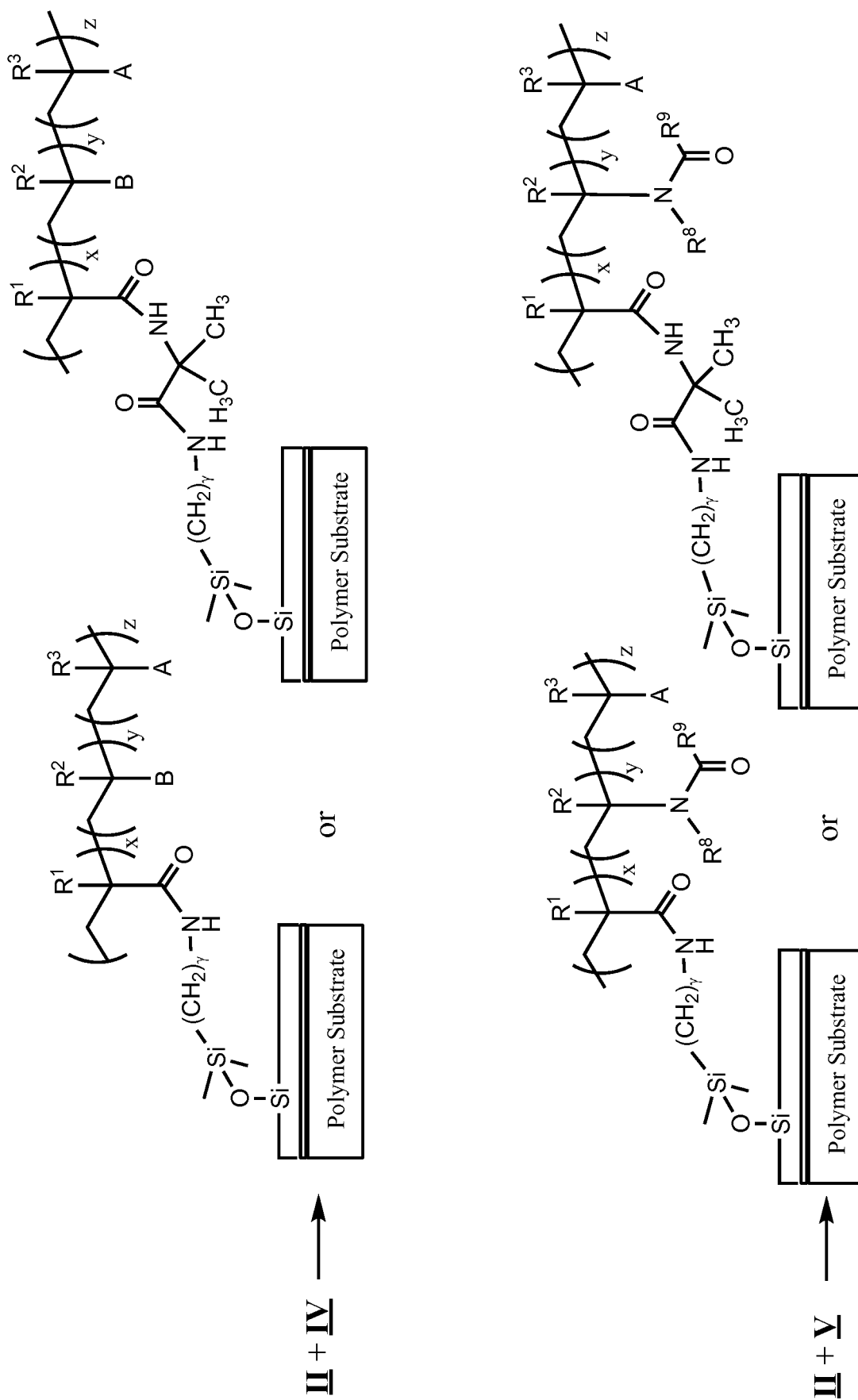


FIG. 14

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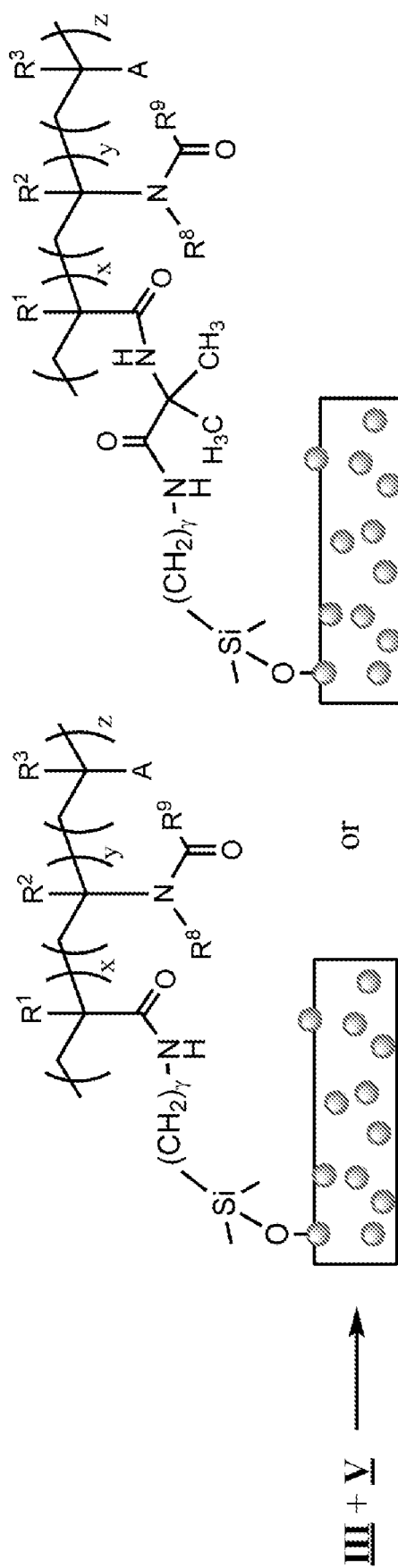
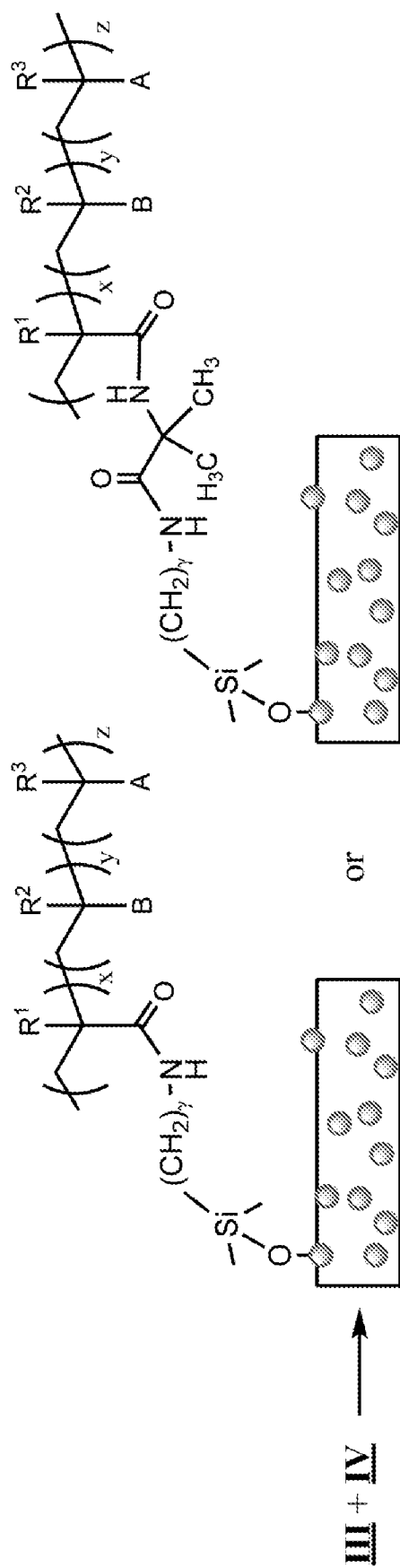


FIG. 15

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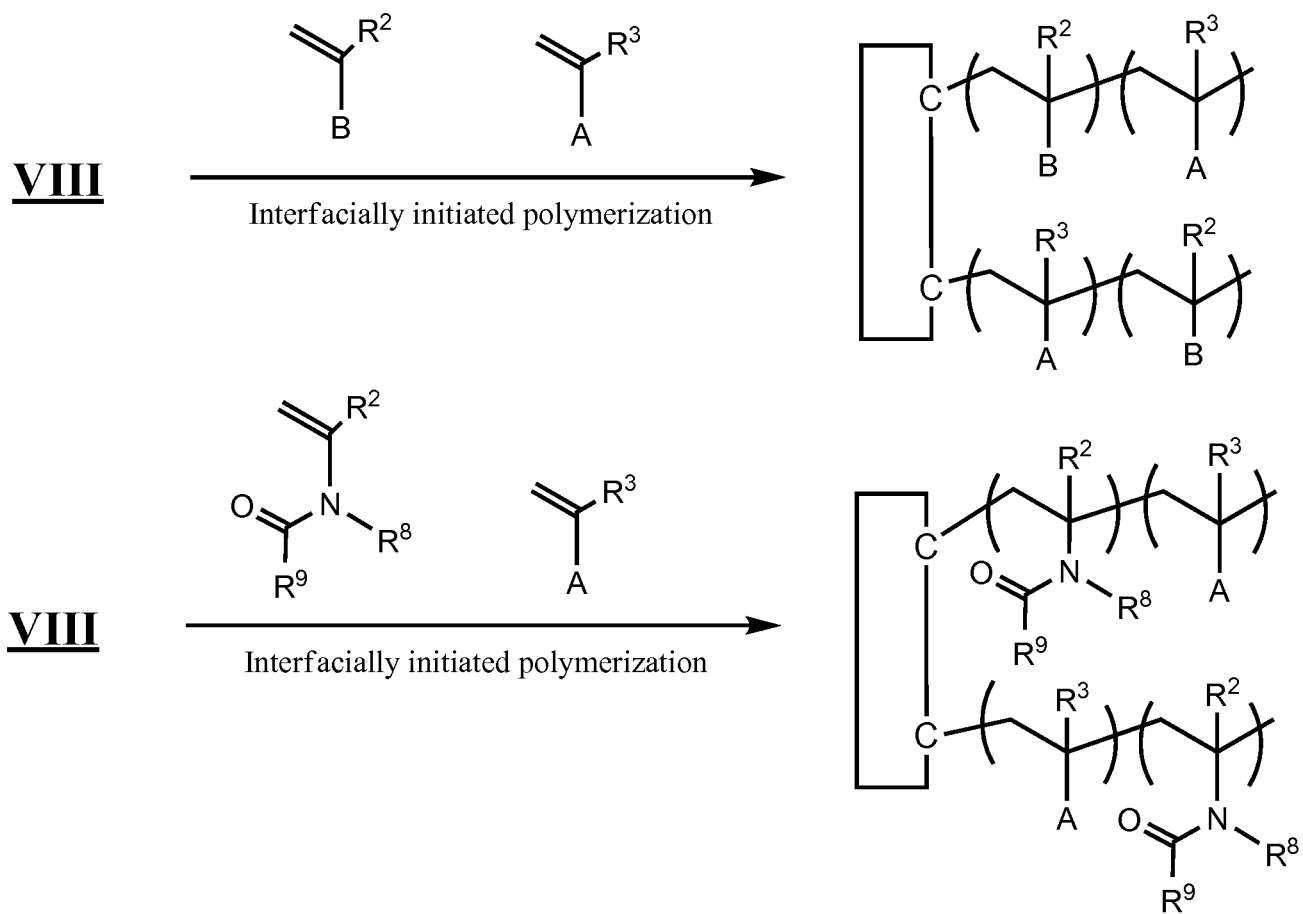
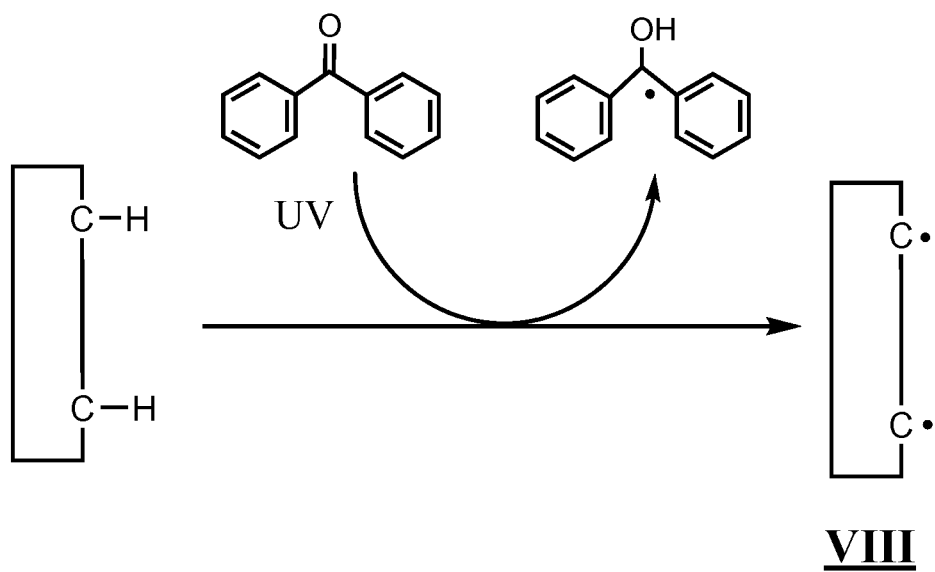


FIG. 16

PCR Chamber Used for Surface Development

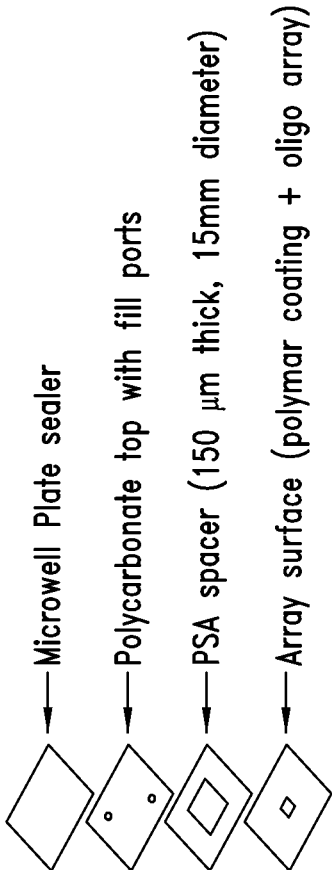
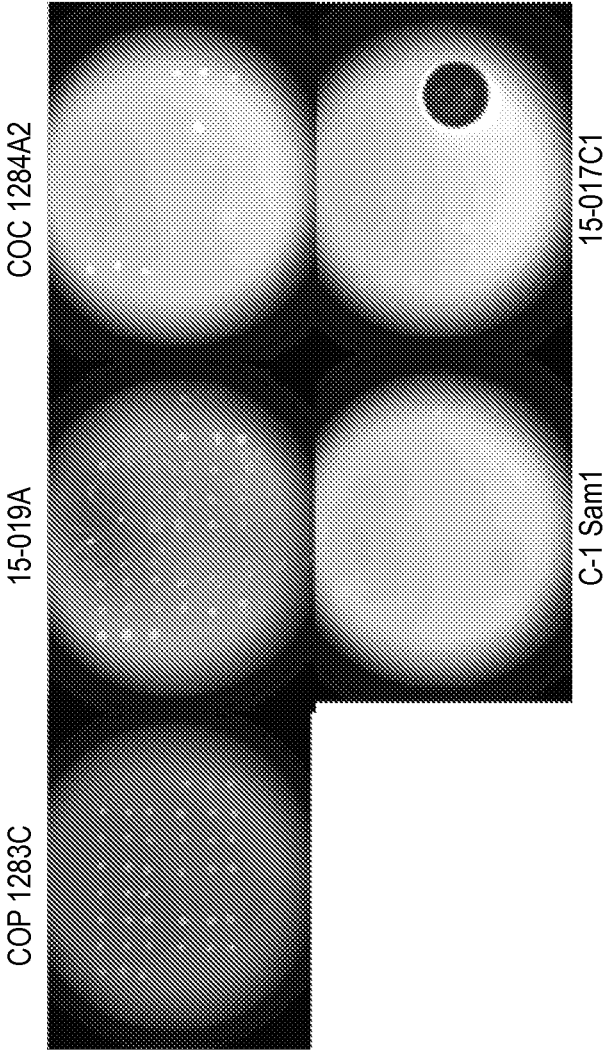


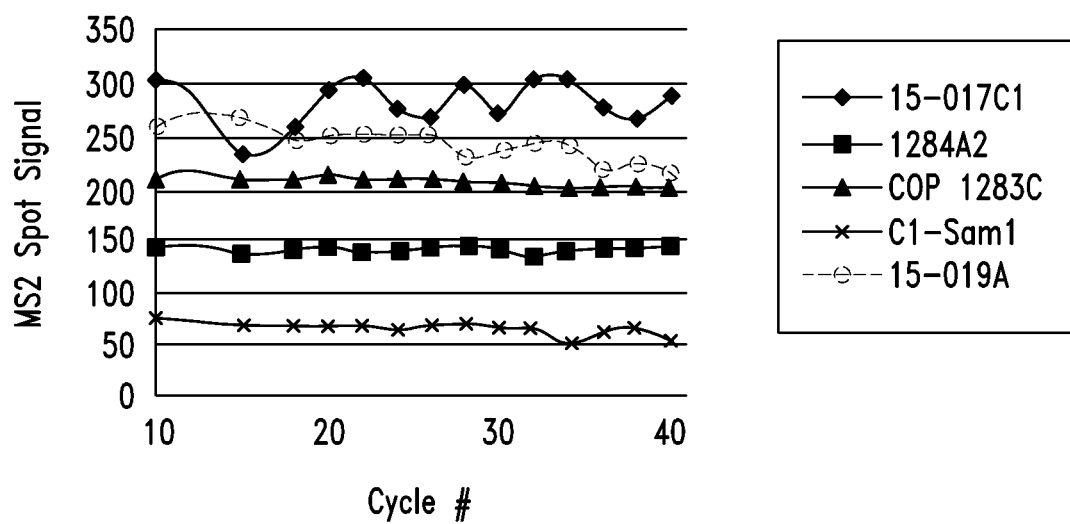
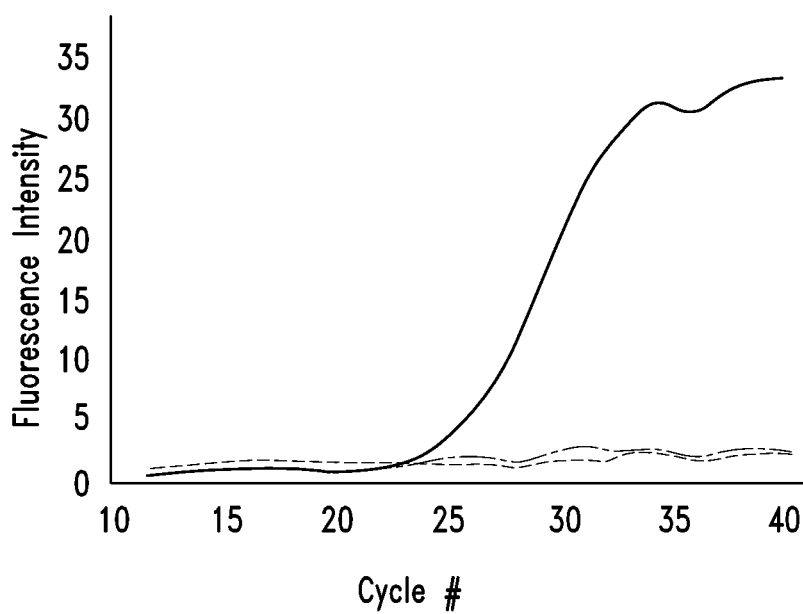
FIG. 17



A Lau ID #	substrate	coating
15-017C1	COC	3% PFPA copolymer on photografted polyallylamine 1
COC 1284A2	COC	7% PFPA interfacial polymer
COP 1283C	COP	3% PFPA copolymer on photografted PEG-amine
C-1 Sam1	COC	3% PFPA copolymer on sputtered, aminosilylated
15-019A	COC	3% PFPA copolymer on photografted polyallylamine 2
SRDX	glass	control

FIG. 18

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*FIG.19**FIG.20*