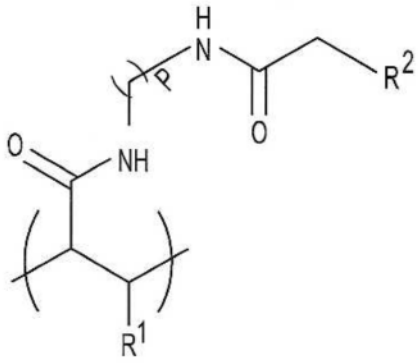
CLAIMS:

1. A flow cell, comprising:

a substrate; and

a copolymer coating attached to at least a portion of the substrate, the copolymer coating including a plurality of copolymer chains, wherein each copolymer chain includes:

a first recurring unit of formula (I):  ,

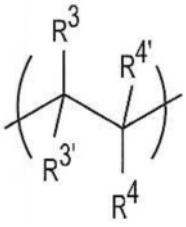
wherein:

R^1 is selected from the group consisting of -H, a halogen, an alkyl, an alkoxy, an alkenyl, an alkynyl, a cycloalkyl, an aryl, a heteroaryl, a heterocycle, and optionally substituted variants thereof;

R^2 is an azido;

each $(CH_2)_p$ can be optionally substituted; and

p is an integer from 1 to 50;

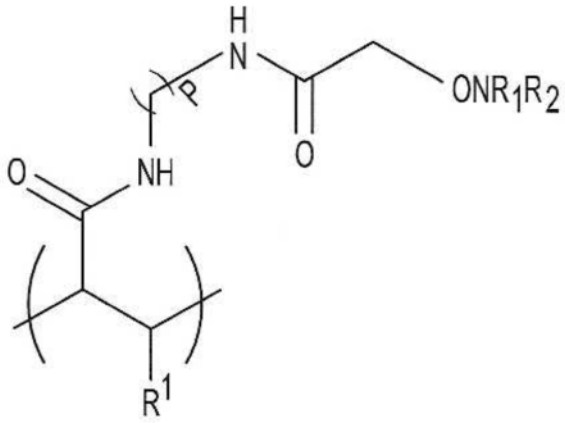
a second recurring unit of formula (II):  , wherein:

each of R^3, $R^{3'}$, R^4, $R^{4'}$ is independently selected from the group consisting of -H, R^5, $-OR^5$, $-C(O)OR^5$, $-C(O)R^5$, $-OC(O)R^5$, $-C(O)NR^6R^7$, and $-NR^6R^7$;

R^5 is selected from the group consisting of -H, -OH, an alkyl, a cycloalkyl, a hydroxyalkyl, an aryl, a heteroaryl, a heterocycle, and optionally substituted variants thereof; and

each of R^6 and R^7 is independently selected from the group consisting of –H and an alkyl; and

a third recurring unit of formula (VI):



wherein:

R^1 is selected from the group consisting of -H, a halogen, an alkyl, an alkoxy, an alkenyl, an alkynyl, a cycloalkyl, an aryl, a heteroaryl, a heterocycle, and optionally substituted variants thereof;

R_1 and R_2 are independently selected from a carbon based substituent;

each $(CH_2)_p$ can be optionally substituted; and

p is an integer from 1 to 50.

2. The flow cell as defined in claim 1, wherein at least some of the copolymer chains include at least one alkoxyamine end group.

3. The flow cell as defined in claim 1, wherein:

each of $R^{3'}$, R^4, and $R^{4'}$ is –H;

R^3 is -C(O)NR^6R^7; and

each of R^6 and R^7 is –H.

4. The flow cell as defined in claim 3, wherein:

R^1 is -H; and

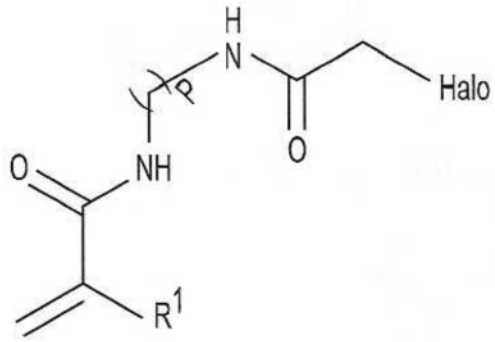
p is 5.

5. The flow cell as defined in any preceding claim, wherein the substrate includes depressions separated by interstitial regions; and the copolymer coating is attached within the depressions.

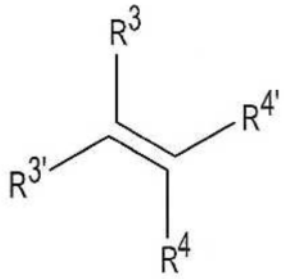
6. The flow cell as defined in any preceding claim, wherein the copolymer coating forms isolated pads on a surface of the substrate; and interstitial regions separate the isolated pads.

7. A method, comprising:

adding i) a nitroxide mediated polymerization unimolecular initiator or ii) a combination of a water soluble initiator and a nitroxide to a mixture of a monomer of



formula (V): , and monomer of formula (IV):



, wherein:

for formula (V):

R^1 is selected from the group consisting of -H, a halogen, an alkyl, an alkoxy, an alkenyl, an alkynyl, a cycloalkyl, an aryl, a heteroaryl, a heterocycle, and optionally substituted variants thereof;

halo is a halogen;

each $(CH_2)_p$ can be optionally substituted; and

p is an integer from 1 to 50; and

for formula (IV):

each of R^3, $R^{3'}$, R^4, $R^{4'}$ is independently selected from the group consisting of -H, R^5, -OR^5, -$C(O)OR^5$, -$C(O)R^5$, -$OC(O)R^5$, -$C(O)NR^6R^7$, and -NR^6R^7;

R^5 is selected from the group consisting of -H, -OH, an alkyl, a cycloalkyl, a hydroxyalkyl, an aryl, a heteroaryl, a heterocycle, and optionally substituted variants thereof; and

each of R^6 and R^7 is independently selected from the group consisting of –H and an alkyl;

thereby generating a copolymer; and

after the copolymerization, converting some of the halogens to alkoxyamines and some other of the halogens to azides.

8. The method as defined in claim 7, wherein converting some of the halogens to alkoxyamines and some other of the halogens to azides involves:

introducing a hydroxylamine to the copolymer so that the halogens are in excess of the hydroxylamine;

heating the copolymer to initiate a reaction where the hydroxylamine displaces some of the halogens;

introducing NaN_3 to the copolymer; and

heating the copolymer to initiate a reaction where the azide displaces some other of the halogens.

9. The method as defined in claim 7, wherein converting some of the halogens to hydroxyamines and some other of the halogens to azides involves:

introducing a mixture of hydroxylamine and NaN_3 to the copolymer; and

heating the copolymer to initiate a reactions where the hydroxylamine displaces some of the halogens and where the azide displaces some other of the halogens.

10. The method as defined in claim 7, wherein converting some of the halogens to hydroxyamines and some other of the halogens to azides involves:

deprotonating a hydroxylamine to form an alkoxyamine anion;

introducing the alkoxyamine anion to the copolymer so that the halogens are in excess of the alkoxyamine anion;

heating the copolymer to initiate a reaction where the alkoxyamine anion displaces some of the halogens;

introducing NaN_3 to the copolymer; and

heating the copolymer to initiate a reaction where the azide displaces some other of the halogens.

11. The method as defined in any one of claims 7 to 10, wherein:

each of $R^{3'}$, R^4, and $R^{4'}$ is –H;

R^3 is -C(O)NR^6R^7; and

each of R^6 and R^7 is –H.

12. The method as defined in claim 11, wherein:

R^1 is -H; and

p is 5.