architecture of the graft polymer formed from the ethylenically unsaturated monomer. The architecture provided by intermittently exposing the polymeric surface provides improved swelling of the coating in aqueous environments when compared with corresponding graft polymer coating prepared by continuous exposure.

In a further aspect, we provide a process for modifying a polymeric surface, the process comprising; contacting the polymeric surface with a solution comprising at least one ethylenically unsaturated monomer wherein the polymeric surface and the solution are each substantially free of initiators; and intermittently exposing the polymeric surface in contact with the solution to ultra-violet light to provide a graft-polymer of the monomer coated on the polymeric surface.

Without wishing to be bound by theory we believe the intermittently exposing the polymeric surface to ultraviolet light creates differences in architecture between polymer layers formed during periods of exposure to ultraviolet light and periods without exposure to ultraviolet light.

The term intermittent exposure as used herein refers to periods of UV light exposure (on-periods) of duration of at least about 0.5 seconds, more preferably at least about 1 second, more preferably at least about 2 seconds. The duration of exposure (on-period) may be up to about 3 minutes, more preferably up to about 60 seconds and still more preferably up to about 45 seconds. The period between exposures (the off-period) may be of duration up to about 60 minutes, more preferably up to about 30 minutes, more preferably still up to about 10 minute such as up to 5 minutes, up to 2 minutes and up to 1 minute. The period between exposures (the off-period) may be of duration at least about 5 seconds, preferably at least about 10 seconds, more preferably at least about 15 seconds, more preferably at least about 20 seconds, more preferably still at least about 25 seconds.

In one set of embodiments the process of intermittently exposing the polymeric surface to ultraviolet light involves periods of UV exposure in the range of from 0.5 seconds to three minutes with the time between exposures being in the range of from five seconds to 60 minutes. The number of exposures to ultraviolet light is generally at least three exposures. In a further set of embodiments the process involves intermittently exposing the polymeric surface comprises subjecting the surface while in contact with the aqueous solution to in the range of from five to one hundred exposures to ultraviolet light lasting in the range of from 0.5 seconds to five minutes such as 0.5 seconds to 3 minutes with a time gap between exposures being in the range of from one second to 60 minutes such as 5 seconds to 60 minutes or 10 seconds to five minutes.

The claims defining the invention are as follows:~~Claims~~

1. A process for modifying a polymeric surface, the process comprising;

contacting the polymeric surface with a solution comprising at least one ethylenically unsaturated monomer wherein the polymeric surface and the solution are each substantially free of initiators; and

intermittently exposing the polymeric surface in contact with the solution to ultra-violet light to provide a graft-polymer of the monomer coated on the polymeric surface.

~~2. A process according to claim 1 wherein the step of exposing the polymeric surface comprises intermittently exposing the polymeric surface to ultraviolet light.~~

23. A process according to claim 12 wherein intermittently exposing the surface comprises at least three periods of UV exposure in the range of from 0.5 seconds to 3 minutes.

34. A process according to claim 1 or 2 wherein intermittently exposing the surface comprises at least three periods of UV exposure in the range of from 1 second to 60 seconds.

45. A process according to any one of the preceding claims~~claim 2 or claim 3~~ wherein intermittently exposing the surface comprises time periods between exposures in the range of from 5 seconds to 60 minutes.

56. A process according to any one of the preceding claims~~claim 2 or claim 3~~ wherein intermittently exposing the surface comprises time periods between exposures in the range of from 10 seconds to 5 minutes.

67. A process according to any one of ~~the preceding~~ claims 1 to 3 ~~claim any one of claims 2 to 6~~ wherein intermittently exposing the surface comprises at least three periods of UV exposure in the range of from 1 second to 15 seconds and time periods between exposures in the range of from 1 second to 60 seconds.

~~8. A process according to any one of the previous claims wherein the polymeric surface and the solution are each substantially free of initiators.~~

79. A process according to any one of the preceding claims wherein the solution is aqueous.

810. A process according to claim 79 wherein the solution further ~~comprising~~ comprises a water miscible solvent.

911. A process according to any one of the preceding claims conducted under an inert gas atmosphere.

1012. A process according to any one of the preceding claims, wherein the polymeric surface is formed of a saturated polymer free of heteroatoms.

1113. A process according to any one of the preceding claims, wherein the polymeric surface is formed from at least one polymer selected from the group consisting of polyethylene, polypropylene, polyisobutylene, ethylene-alphaolefin copolymers, polystyrene, styrene copolymers, poly-isoprene, polybutadiene, polychloroprene rubbers, polyisobutylene rubber, ethylene-propylenediene rubbers and isobutylene-isoprene copolymers.

1214. A process according to any one of the previous claims wherein the polymeric surface is formed of polystyrene and the surface is exposed intermittently to ultraviolet light comprising at least three exposures to ultraviolet light for a period in the range of from 1 second to 15 seconds with intervals between exposure in the range of from 1 second to 60 seconds.

1315. A process according to any one of the preceding claims, wherein the at least one ethylenically unsaturated monomer comprises a first monomer comprising a carboxylic acid functional group and a second monomer having low bio fouling properties.

1416. A process according to claim 1315, wherein the first monomer comprises at least one selected from the group consisting of acrylic acid, methacrylic acid and 2carboxyethyl acrylate and the second monomer comprises at least one selected from the group consisting of acrylamide, poly(ethylene glycol) (meth)acrylate, methoxy poly(ethylene glycol) (meth)acrylate, N-(2hydroxypropyl) methacrylamide and 2-methacryloyloxyethyl phosphorylcholine.

1517. A process according to claim 1315 comprising acrylic acid as a first monomer and acrylamide as a second monomer.

1618. A process according to any one of claims 1315 to 1517, wherein the molar ratio of said first monomer to said second monomer in the solution is in the range of from 20:80 to 90:10.

1719. A process according to any one of the preceding claims, wherein the polymeric coating is used in cell culture.

1820. A cell culture plate comprising a polymeric surface modified in accordance with the process according to any one of claims 1 to 1719.