What is claimed is:

1. An article comprising a material having a thickness, first and second generally opposed major surfaces, and first and second regions across the thickness, wherein the first region is adjacent the first major surface, a layer comprising a polymeric material on the first major surface, and the polymeric material also present within the first region as a single phase with the substrate, and wherein the thickness of the first region is at least 0.01 micrometer.

2. The article of claim 1, wherein the layer comprises a nanoscale phase dispersed in the polymeric material.

3. The article of claim 2, wherein the nanoscale phase is present in a range from 60 nm to 90 nm in size, in a range from 30 nm to 50 in size, and less than 25 nm in size, and wherein the nanoscale phase is present in the range from 0.25 wt.% to 50 wt.% for sizes in the range from 60 nm to 90 nm, 1 wt.% to50 wt.% for sizes in a range from 30 nm to 50 nm, and 0.25 wt.% to 25 wt.% for sizes less than 25nm, based on the total weight of the matrix and nanoscale phase.

4. The article of either claim 2 or 3, wherein the nanoscale phase is present in a range from 60 nm to 90 nm in size, in a range from 30 nm to 50 in size, and less than 25 nm in size, and wherein the nanoscale phase is present in the range from 0.1 vol.% to 35 vol.% for sizes in the range from 60 nm to 90 nm, 0.1 vol.% to 25 vol.% for sizes in a range from 30 nm to 50 nm, and 0.1 vol.% to 10 vol.% for sizes less than 25 nm, based on the total volume of the matrix and nanoscale phase.

5. The article of any of claims 2 to 4, wherein the nanoscale phase is present in a range from 1 nm to 100 nm in size, and wherein the nanoscale phase is present in less than 1.25 wt.%, based on the total weight of the matrix and nanoscale phase.

6. The article of any of claims 2 to 5, wherein the nanoscale phase comprises submicrometer particles.

7. A method of making the article of any of claims 2 to 6, the method comprising:

providing a composition comprising polymeric precursor and optional solvent;

penetrating at least a portion of the polymeric precursor and optional solvent into a material through the first major surface of the material and providing a layer of the composition on the first major surface of the material;

removing the solvent; and

at least partially curing the polymeric precursor to provide a polymeric matrix.

8. The method of claim 7, wherein the solvent is present is and is at least one of methoxy propanol and methyl ethyl ketone; methoxy propanol and ethyl acetate; methoxy propanol and methyl isobutyl ketone; acetone and methyl ethyl ketone; acetone and ethyl acetate; acetone and methyl isobutyl ketone; isopropanol and methyl ethyl ketone; isopropanol and ethyl acetate; or isopropanol and methyl isobutyl ketone.

9. The method of either claim 7 or 8, wherein the matrix is etched to a depth of at least in a range from 100 nm to 500 nm.

10. A method of making the article of any of claims 2 to 6, the method comprising:

providing a composition comprising polymeric precursor, solvent, and nanoscale phase;

penetrating at least a portion of the polymeric precursor and optional solvent into a material through the first major surface of the material and providing a layer of the composition on the first major surface of the material;

at least partially curing the polymeric precursor in the material to provide the single phase polymeric material and polymeric matrix with the nanoscale phase dispersed in a layer; and

anisotropically etching at least a portion of the polymeric matrix using plasma to form the random anisotropic nanostructured surface.

11. The method of claim 10, wherein the solvent is present and is at least one of methoxy propanol and methyl ethyl ketone; methoxy propanol and ethyl acetate; methoxy propanol and methyl isobutyl ketone; acetone and methyl ethyl ketone; acetone and ethyl acetate; acetone and methyl isobutyl ketone; isopropanol and methyl ethyl ketone; isopropanol and ethyl acetate; or isopropanol and methyl isobutyl.

Claims:

1. An article comprising a material having a thickness, first and second generally opposed major surfaces, and first and second regions across the thickness, wherein the first region is adjacent the first major surface, a layer comprising a polymeric material on the first major surface, and the polymeric material also present within the first region as a single phase with the substrate, wherein the thickness of the first region is at least 0.01 micrometer, wherein the layer exhibits a random anisotropic nanostructured surface, and wherein the nanostructured anisotropic surface comprises nanoscale features having a height to width ratio of at least 2:1.

2. The article of claim 1, wherein the layer comprises a nanoscale phase dispersed in the polymeric material.

3. The article of claim 2, wherein the nanoscale phase is present in a range from 60 nm to 90 nm in size, in a range from 30 nm to 50 in size, and less than 25 nm in size, and wherein the nanoscale phase is present in the range from 0.25 wt.% to 50 wt.% for sizes in the range from 60 nm to 90 nm, 1 wt.% to50 wt.% for sizes in a range from 30 nm to 50 nm, and 0.25 wt.% to 25 wt.% for sizes less than 25nm, based on the total weight of the matrix and nanoscale phase.

4. The article of either claim 2 or 3, wherein the nanoscale phase is present in a range from 60 nm to 90 nm in size, in a range from 30 nm to 50 in size, and less than 25 nm in size, and wherein the nanoscale phase is present in the range from 0.1 vol.% to 35 vol.% for sizes in the range from 60 nm to 90 nm, 0.1 vol.% to 25 vol.% for sizes in a range from 30 nm to 50 nm, and 0.1 vol.% to 10 vol.% for sizes less than 25 nm, based on the total volume of the matrix and nanoscale phase.

5. The article of any of claims 2 to 4, wherein the nanoscale phase is present in a range from 1 nm to 100 nm in size, and wherein the nanoscale phase is present in less than 1.25 wt.%, based on the total weight of the matrix and nanoscale phase.

6. The article of any of claims 2 to 5, wherein the nanoscale phase comprises submicrometer particles.

7. A method of making the article of any of claims 2 to 6, the method comprising:

providing a composition comprising polymeric precursor and optional solvent;

penetrating at least a portion of the polymeric precursor and optional solvent into a material through the first major surface of the material and providing a layer of the composition on the first major surface of the material;

removing the solvent; and

at least partially curing the polymeric precursor to provide a polymeric matrix.

8. The method of claim 7, wherein the solvent is present is and is at least one of methoxy propanol and methyl ethyl ketone; methoxy propanol and ethyl acetate; methoxy propanol and methyl isobutyl ketone; acetone and methyl ethyl ketone; acetone and ethyl acetate; acetone and methyl isobutyl ketone; isopropanol and methyl ethyl ketone; isopropanol and ethyl acetate; or isopropanol and methyl isobutyl ketone.

9. The method of either claim 7 or 8, wherein the matrix is etched to a depth of at least in a range from 100 nm to 500 nm.

10. A method of making the article of any of claims 2 to 6, the method comprising:

providing a composition comprising polymeric precursor, solvent, and nanoscale phase;

penetrating at least a portion of the polymeric precursor and optional solvent into a material through the first major surface of the material and providing a layer of the composition on the first major surface of the material;

at least partially curing the polymeric precursor in the material to provide the single phase polymeric material and polymeric matrix with the nanoscale phase dispersed in a layer; and

anisotropically etching at least a portion of the polymeric matrix using plasma to form the random anisotropic nanostructured surface.

11. The method of claim 10, wherein the solvent is present and is at least one of methoxy propanol and methyl ethyl ketone; methoxy propanol and ethyl acetate; methoxy propanol and methyl isobutyl ketone; acetone and methyl ethyl ketone; acetone and ethyl acetate; acetone and methyl isobutyl ketone; isopropanol and methyl ethyl ketone; isopropanol and ethyl acetate; or isopropanol and methyl isobutyl.