WHAT CLAIMED IS:

1. A capacitor that incorporates a conductive element that conforms to the shape of an array of elongated bodies comprising:

a first conductive element that conforms to the shape of an array of elongated bodies;

a second conductive element that conforms to the shape of an array of elongated bodies; and

a dielectric material disposed in between the first conductive element and the second conductive element, and thereby physically separates them.

2. The capacitor of claim 1, wherein:

the first conductive element and the second conductive element are distinct structures that are configured to interdigitate, but not physically contact one another.

3. The capacitor of claim 2, wherein the inter-electrode gap is less than approximately 10 μm.

4. The capacitor of claim 2, wherein the first conductive element and the second conductive element each conform to the shape of an array of cylinders.

5. The capacitor of claim 2, wherein the first conductive element and the second conductive element each conform to the shape of an array of hexagonal elongated bodies.

6. The capacitor of claim 2, wherein the first conductive element and the second conductive element each constitute an array of elongated bodies.

7. The capacitor of claim 2, wherein the first conductive element and the second conductive element each constitute a coating deposited onto an array of elongated bodies.

8. The capacitor of claim 2, wherein the dielectric material is Polybenzimidazole.

9. The capacitor of claim 8, wherein the dielectric material is a Celazole ® Polybenzimidazole material.

10. The capacitor of claim 1,wherein:

the first conductive element is a layer disposed onto an array of elongated bodies;

the dielectric material is a layer that is disposed onto the first conductive element; and

the second conductive element is a layer that is disposed onto the dielectric material.

11. The capacitor of claim 10, wherein the array of elongated bodies comprises conductive silicon.

12. The capacitor of claim 11, wherein the array of elongated bodies comprises a layer of dielectric material disposed onto the conductive silicon.

13. The capacitor of claim 12, wherein the first conductive element and the second conductive element each comprise TiN.

14. The capacitor of claim 13, wherein the dielectric material comprises Al_2O_3.

15. The capacitor of claim 10, wherein the array of elongated bodies comprises carbon nanotubes.

16. The capacitor of claim 15, wherein the array of elongated bodies comprises a silicon oxide layered onto the carbon nanotubes.

17. The capacitor of claim 16, wherein the first conductive element and the second conductive element each comprise TiN.

18 The capacitor of claim 16, wherein the dielectric material comprises Al_2O_3.

19 The capacitor of claim 18, further comprising:

a second dielectric material;

a third conductive element;

a third dielectric material;

a fourth conductive element;

a fourth dielectric material; and

a fifth conductive element;

wherein:

the second dielectric material is a layer disposed onto the second conductive element;

the third conductive element is a layer that is disposed onto the second dielectric material;

the third dielectric material is a layer disposed onto the third conductive element;

the fourth conductive element is a layer that is disposed onto the third dielectric material;

the fourth dielectric material is a layer that is disposed on the fourth conductive element; and

the fifth conductive element is a layer that is disposed onto the fourth dielectric material.

20. The capacitor of claim 1, wherein the dielectric material is $BaTiO_3$.

21. The capacitor of claim 1, wherein the first conductive element, the second conductive element, and the dielectric material have similar coefficients of thermal expansion.

22. The capacitor of claim 1, wherein the first conductive element, the second conductive element, and the dielectric material allow the capacitor to operate at within a temperature range from approximately 20°C to 360°C.

WHAT CLAIMED IS:

1. A capacitor that incorporates a conductive element that conforms to the shape of an array of elongated bodies comprising:

a first conductive element that conforms to the shape of a first array of elongated bodies;

a second conductive element that conforms to the shape of a second array of elongated bodies; and

a dielectric material disposed in between the first conductive element and the second conductive element, and thereby physically separates them;

wherein the dielectric material comprises Polybenzimidazole.

2. The capacitor of claim 1, wherein:

the first conductive element and the second conductive element are distinct structures that are configured to interdigitate, but not physically contact one another.

3. The capacitor of claim 2, wherein the inter-electrode gap is less than approximately 10 μm.

4. The capacitor of claim 2, wherein the first conductive element and the second conductive element each conform to the shape of an array of cylinders.

5. The capacitor of claim 2, wherein the first conductive element and the second conductive element each conform to the shape of an array of hexagonal elongated bodies.

6. The capacitor of claim 2, wherein the first conductive element and the second conductive element each constitute an array of elongated bodies.

7. The capacitor of claim 1, wherein the first conductive element and the second conductive element each constitute a coating deposited onto an array of elongated bodies.

8. The capacitor of claim 2, wherein the dielectric material is a Celazole ® Polybenzimidazole material.

9. The capacitor of claim 1,wherein:

the first conductive element is a layer disposed onto an array of elongated bodies;

the dielectric material is a layer that is disposed onto the first conductive element; and

the second conductive element is a layer that is disposed onto the dielectric material.

10. The capacitor of claim 9, wherein the array of elongated bodies comprises conductive silicon.

11. The capacitor of claim 10, wherein the array of elongated bodies comprises a layer of dielectric material disposed onto the conductive silicon.

12. The capacitor of claim 11, wherein the first conductive element and the second conductive element each comprise TiN.

13. The capacitor of claim 12, wherein the dielectric material comprises Al_2O_3.

14. The capacitor of claim 9, wherein the array of elongated bodies comprises carbon nanotubes.

15. The capacitor of claim 14, wherein the array of elongated bodies comprises a silicon oxide layered onto the carbon nanotubes.

16. The capacitor of claim 15, wherein the first conductive element and the second conductive element each comprise TiN.

17. The capacitor of claim 15, wherein the dielectric material comprises Al_2O_3.

18. The capacitor of claim 17, further comprising:

a second dielectric material;

a third conductive element;

a third dielectric material;

a fourth conductive element;

a fourth dielectric material; and

a fifth conductive element;

wherein:

the second dielectric material is a layer disposed onto the second conductive element;

the third conductive element is a layer that is disposed onto the second dielectric material;

the third dielectric material is a layer disposed onto the third conductive element;

the fourth conductive element is a layer that is disposed onto the third dielectric material;

the fourth dielectric material is a layer that is disposed on the fourth conductive element; and

the fifth conductive element is a layer that is disposed onto the fourth dielectric material.

19. The capacitor of claim 1, wherein the first conductive element, the second conductive element, and the dielectric material have similar coefficients of thermal expansion.

20. The capacitor of claim 1, wherein the first conductive element, the second conductive element, and the dielectric material allow the capacitor to operate at within a temperature range from approximately 20°C to 360°C.