CLAIMS

1. A capacitor comprising

a first electrode,

a second electrode, and

a dielectric layer of molecular material disposed between said first and second electrodes,

wherein said electrodes are flat and planar and positioned parallel to each other, and

the molecular material is described by the general formula

$$D_p\text{-(Core)-}H_q \qquad (I)$$

where ***Core*** is a polarizable conductive anisometric core, having conjugated π-systems, and characterized by a longitudinal axis

D and ***H*** are insulating substituents, and

p and ***q*** are numbers of the ***D*** and ***H*** substituents accordingly,

wherein said substituents are attached to the polarizable anisometric core in apex positions, and p and q are independently selected from values 1, 2, 3, 4, and 5.

2. A capacitor, according to Claim 1, wherein at least one of the insulating groups D and at least one of the insulating groups H is each selected independently from the group consisting of alkyl, fluorinated alkyl, chlorinated alkyl, branched and complex alkyl, branched and complex fluorinated alkyl, branched and complex chlorinated alkyl groups, and any combination thereof.

3. A capacitor according to Claim 1, wherein the anisometric cores form conductive stacks due to π- π-interaction, and the insulating substituents form the insulating sublayers surrounding said stacks, wherein a twist angle $\boldsymbol{\alpha}$ is formed between the longitudinal axes of the adjacent anisometric cores, said twist angle is in the range of $0° \leq \boldsymbol{\alpha} \leq 90°$, and distance between the cores in the stacks is 0.34±0.1nm.

4. A capacitor according to Claim 3, wherein the anisometric cores form the twisted conductive stacks, wherein said twist angle is in the range of $0° < \boldsymbol{\alpha} \leq 90°$.

5. A capacitor according to Claim 4, wherein the dielectric layer of molecular material has a hexagonal crystal structure.

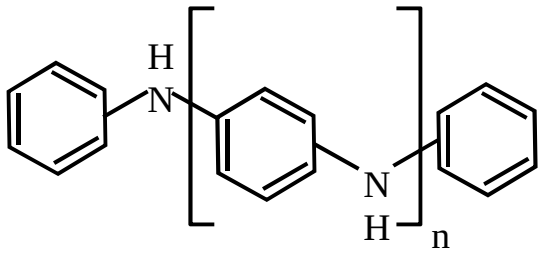
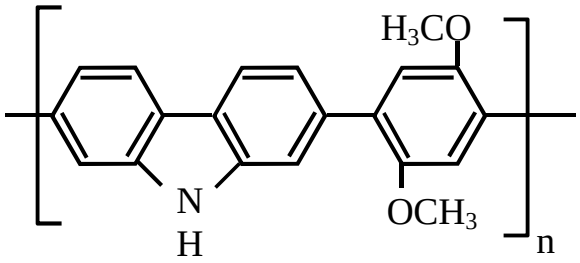
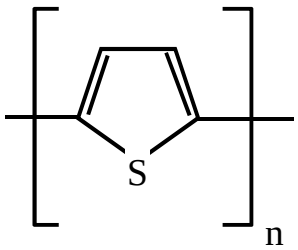
6. A capacitor according to Claim 3, wherein the anisometric cores form the conductive stacks, wherein said twist angle $\boldsymbol{\alpha}$ equals zero, and the longitudinal axes of the anisometric cores are perpendicular to the electrodes.

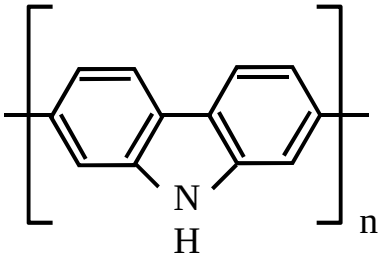
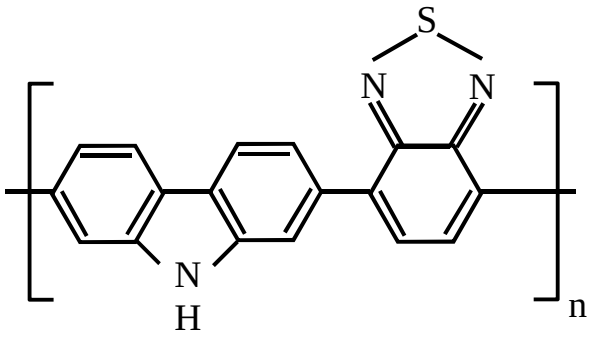
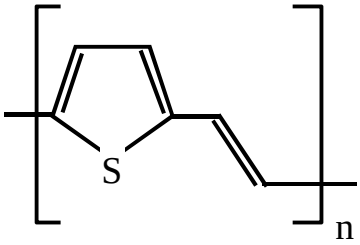
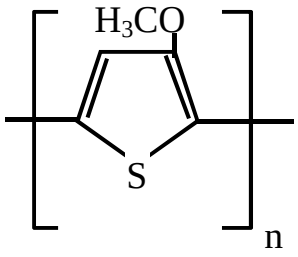
7. A capacitor according to Claim 6, wherein the dielectric layer of molecular material has a lamellar crystal structure.

8. A capacitor according to Claim 7, wherein said polarizable anisometric cores possess translational periodicity and symmetry at least in one direction.

9. A capacitor according to Claim 1, wherein the polarizable anisometric core is an electroconductive oligomer, and said electroconductive oligomers form molecular stacks due to π- π-interaction.

10. A capacitor according to Claim 9, wherein said electroconductive oligomer is selected from the group consisting of the following structural formulas 1 to 7:

	1
	2
	3

	4
	5
	6
	7

where n = 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12.

11. An energy storage device according to Claim 1, wherein the electrodes are made of Pt, Cu, Al, Ag or Au.

12. A capacitor according to Claim 1, comprising two electrodes made of copper, polyaniline (PANI) as the polarizable anisometric core, and fluorinated alkyl substituents as the insulating substituents.

13. A method of producing a capacitor, which comprises the steps of

a) preparation of a conducting substrate serving as one of the electrodes,

b) application of a molecular material on the substrate,

c) formation of the solid layer of the molecular material, and

d) formation of the second electrode on the solid molecular material layer,

wherein the molecular material is described by the general formula

$$D_p\text{-(Core)-}H_q \qquad (I)$$

where ***Core*** is a polarizable conductive anisometric core, having conjugated π-systems and characterized by a longitudinal axis,

D and ***H*** are insulating substituents, and

p and ***q*** are numbers of the ***D*** and ***H*** substituents accordingly,

wherein said substituents are attached to the polarizable anisometric core in apex positions, and p and q are independently selected from values 1, 2, 3, 4, and 5.

14. A method according to Claim 13, wherein at least one of the insulating groups D and H are independently selected from the list comprising alkyl, fluorinated alkyl, chlorinated alkyl, branched and complex alkyl, branched and complex fluorinated alkyl, branched and complex chlorinated alkyl groups, and any combination thereof.

15. A method according to Claim 13, wherein the application step b) comprises application of a solution of the molecular material, and the solid layer formation step c) comprises drying to form a solid molecular material layer.

16. A method according to Claim 13, wherein the application step b) comprises application of a melt of the molecular material, and the solid layer formation step c) comprises cooling down to form a solid molecular material layer.