CLAIMS

1. A method for fabricating a film (1) comprising at least one polymer layer (3) formed of polyazulene, or of a copolymer, wherein one of the monomers is azulene, or of any combination thereof, wherein the film is situated on at least one surface of a substrate (4), wherein the method comprises the steps of:

a) forming an oxidant layer (2) on a deposition surface by applying a solution comprising an oxidant on the deposition surface;

b) forming a polymer layer (3) formed of polyazulene, or of a copolymer, wherein one of the monomers is azulene, or of any combination thereof, by exposing the deposition surface to at least azulene monomer vapour at a polymerization temperature of 20 – 95 °C under atmospheric pressure,

wherein step a) precedes step b), and wherein, during step b), the temperature of the deposition surface differs from the polymerization temperature by 1 – 30 °C.

2. The method of claim 1, wherein the method comprises repeating step a) and step b) one or more times.

3. The method of any one of the preceding claims, wherein the polymer layer (3) is formed on the deposition surface by atmospheric pressure vapour phase polymerization (VPP).

4. The method of any one of the preceding claims, wherein step b) is continued for 1 – 20 minutes, or 2 – 16 minutes, or 4 – 8 minutes.

5. The method of any one of the preceding claims, wherein step b) is continued until the thickness of the polymer layer is 10 - 100 nm, or 20 – 90 nm, or 30 – 80 nm, or 40 – 60 nm.

6. The method of any one of the preceding claims, wherein in step b), the deposition surface is

exposed to at least azulene monomer vapour and at least one further monomer vapour selected from a group consisting of 3,4-ethylenedioxythiophene (EDOT), pyrrole, aniline, thiophene, and phenylene.

7. The method of any one of the preceding claims, wherein the method is carried out as a batch process or a continuous process.

8. The method of any one of the preceding claims, wherein, during step b), the temperature of the deposition surface is 25 - 75 °C, or 30 – 70 °C, or 35 – 65 °C, or 40 – 50 °C, or 45 - 55 °C.

9. The method of any one of the preceding claims, wherein, during step b), the polymerization temperature is 25 – 90 °C, or 35 - 85 °C, or 40 – 80 °C, or 45 – 75 °C, or 50 – 60 °C, or 55 - 65 °C.

10. The method of any one of the preceding claims, wherein, during step b), the temperature of the deposition surface is 1 – 25 °C, or 5 – 20 °C, or 10 - 15 °C, lower than the polymerization temperature or 1 – 15 °C, or 5 – 10 °C, higher than the polymerization temperature.

11. The method of any one of the preceding claims, wherein the oxidant is selected from a group consisting of FETOS, $FeCl_3$, $CuCl_2$, $CuBr_2$, and $Fe(OTf)_3$.

12. The method of any one of the preceding claims, wherein the concentration of the solution comprising the oxidant is 60 – 500 mM, or 70 – 480 mM, or 120 - 320 mM, or 180 – 240 mM.

13. The method of any one of the preceding claims, wherein the solution comprising the oxidant is spin coated on the deposition surface.

14. The method of any one of the preceding claims, wherein the method comprises, after step b), the step of annealing the film at a temperature of 60 - 100 °C.

15. A film (1) comprising at least one polymer layer (3) formed of polyazulene, or of a copoly-

mer, wherein one of the monomers is azulene, or of any combination thereof, wherein the film is situated on at least one surface of a substrate (4), wherein the total thickness of the film is 10 nm - 100 µm, the average roughness of the film is below 150 nm, and the sheet resistance of the film is 1 - 80 MΩ/□.

16. The film of claim 15, wherein the total thickness of the film is 20 nm – 50 µm, or 50 nm – 10 µm, or 100 nm – 1 µm, or 200 nm - 500 nm.

17. The film of any one of claims 15 – 16, wherein the film is conductive.

18. The film of any one of claims 15 – 17, wherein the average roughness of the film is below 100 nm, or below 80 nm, or below 50 nm, or below 25 nm, or below 15 nm, or below 10 nm.

19. The film of any one of claims 15 – 18, wherein the areal capacitance of the film is 0 – 10 mF/cm^2, or 0.01 - 9 mF/cm^2, or 0.05 – 8 mF/cm^2, or 0.2 – 7 mF/cm^2, or 1 – 5 mF/cm^2, or 2 – 4 mF/cm^2.

20. The film of any one of claims 15 – 19, wherein the volumetric capacitance is 200 - 2000 F/cm^3, or 250 – 1500 F/cm^3, or 300 – 1200 F/cm^3, or 500 – 1000 F/cm^3, or 600 – 800 F/cm^3.

21. The film of any one of claims 15 – 20, wherein the transmittance of the film is 10 – 95%, or 20 - 85%, or 30 – 75%.

22. The film of any one of claims 15 – 21, wherein the sheet resistance of the film is 2 - 70 MΩ/□, or 5 - 50 MΩ/□, or 10 - 40 MΩ/□, or 15 – 30 MΩ/□.

23. The film of any one of claims 15 – 22, wherein the conductivity of the film is 0 – 3 S.cm, or 0.01 – 2 S.cm, or 0.05 – 1.5 S.cm, or 0.1 – 1.0 S.cm, or 0.3 – 0.8 S.cm, or 0.4 – 0.6 S.cm.

24. A device comprising a film (1) as defined in any one of claims 15 – 23.

25. The device of claim 24, wherein the device is an organic electrochemical transistor, an electrochemical transducer, an electrochromic device, an electroluminescent device, an electroluminescent display, an organic capacitor, a supercapacitor, a sensor, a biosensor, an energy harvesting device, an antistatic material, a photovoltaic device, a storage device or a thermoelectric device.

26. Use of the film as defined in any one of claims 15 - 23 as an antistatic coating or an electrode in/of an electronic device.

27. A system for fabricating a film (1) comprising at least one polymer layer (3) formed of polyazulene, or of a copolymer, wherein one of the monomers is azulene, or of any combination thereof, wherein the film is situated on at least one surface of a substrate (4), wherein the system comprises:

a) an oxidant unit (12) configured to apply a solution comprising an oxidant on a deposition surface for forming an oxidant layer (2) on the deposition surface; and

b) a chamber (5) configured to expose the deposition surface to at least azulene monomer vapour at a polymerization temperature of 25 – 95 °C under atmospheric pressure for forming a polymer layer (3) formed of polyazulene, or of a copolymer, wherein one of the monomers is azulene, or of any combination thereof,

wherein the oxidant unit precedes the chamber, and wherein, in the chamber, the temperature of the deposition surface is configured to differ from the polymerization temperature by 1 – 30 °C.