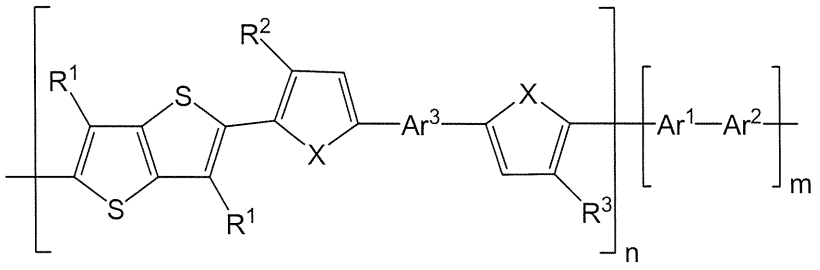
WHAT IS CLAIMED IS:

1. A polymer of formula I:



I

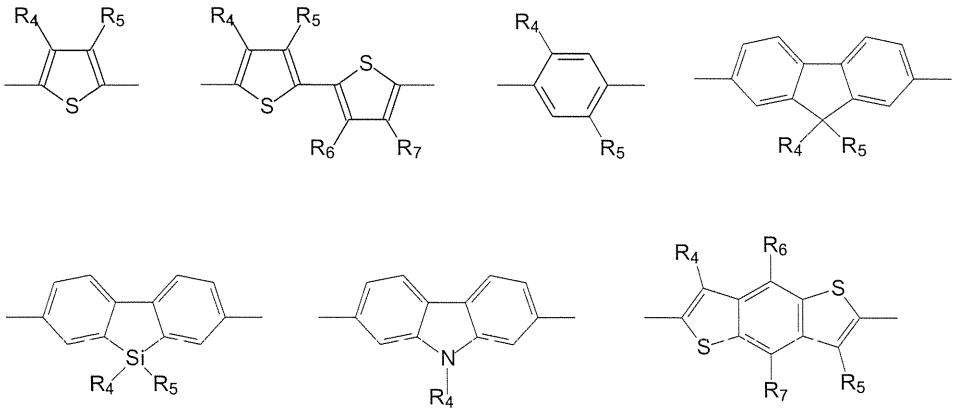
wherein:

Ar^1 and Ar^2 are either

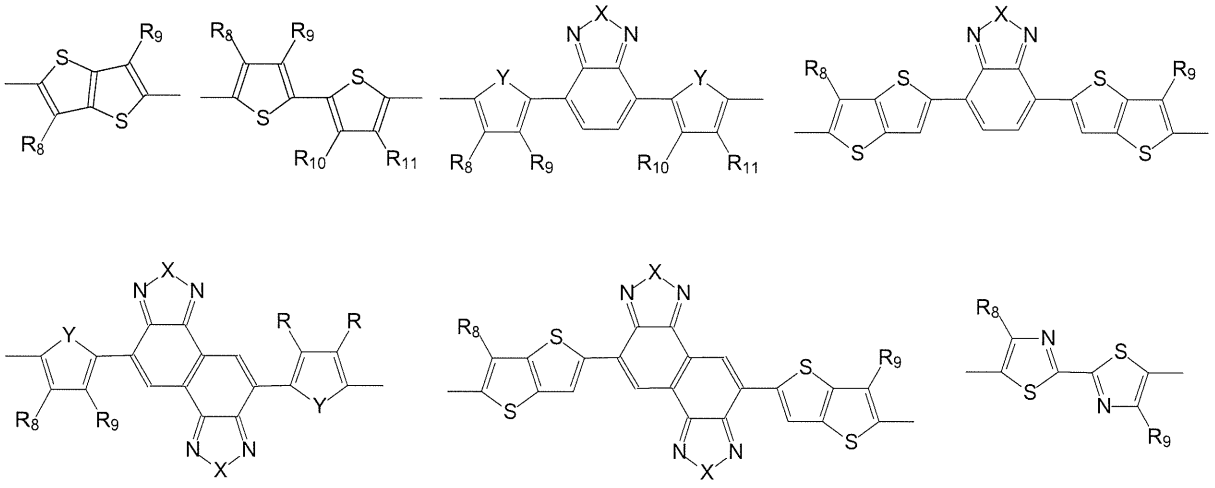
(i) both absent, or

(ii) both present and

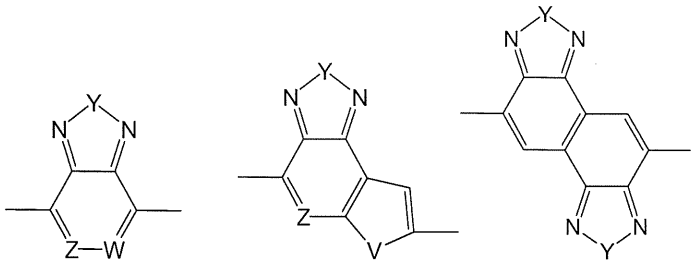
Ar^1 is selected from:



and Ar^2 is selected from:



Ar^3 is selected from



V is selected from O, S, N, Se, C–R^{12}, C=C, C=N and N=C;

X and Y are each independently selected from O, S, Se and N;

W and Z are each independently selected from C–R^{12} and N;

each occurrence of R^1 (of 2n total occurrences) is each independently selected from H, straight or branched alkyl having from 1 to 60 backbone atoms, straight or branched alkenyl having from 2 to 60 backbone atoms, straight or branched alkynyl having from 2 to 60 backbone atoms, straight or branched arylalkyl having from 6 to 60 backbone atoms, straight or branched arylalkenyl having from 7 to 60 backbone atoms, straight or branched arylalkynyl having from 7 to

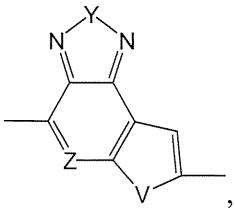
60 backbone atoms, straight or branched alkoxy having from 2 to 60 backbone atoms, straight or branched alkenyloxy having from 3 to 60 backbone atoms, straight or branched alkynyloxy having from 3 to 60 backbone atoms, straight or branched arylalkoxy having from 7 to 60 backbone atoms, straight or branched arylalkenyloxy having from 8 to 60 backbone atoms, straight or branched arylalkynyloxy having from 8 to 60 backbone atoms, straight or branched alkylamino having from 2 to 60 backbone atoms, straight or branched alkenylamino having from 3 to 60 backbone atoms, straight or branched alkynylamino having from 3 to 60 backbone atoms, straight or branched arylalkylamino having from 7 to 60 backbone atoms, straight or branched arylalkenylamino having from 8 to 60 backbone atoms, straight or branched arylalkynylamino having from 8 to 60 backbone atoms, straight or branched ester having from 2 to 60 backbone atoms, straight or branched carbonyl having from 1 to 60 backbone atoms;

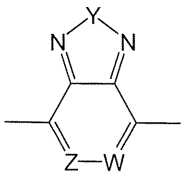
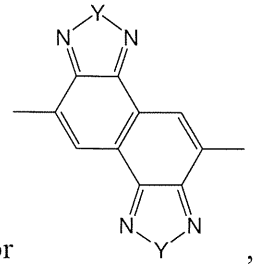
each occurrence of each of R, R^4, R^5, R^6, R^7, R^8, R^9, R^{10} and R^{11} (of m or 2m total occurrences) is each independently selected from straight or branched alkyl having from 1 to 60 backbone atoms, straight or branched alkenyl having from 2 to 60 backbone atoms, straight or branched alkynyl having from 2 to 60 backbone atoms, straight or branched arylalkyl having from 6 to 60 backbone atoms, straight or branched arylalkenyl having from 7 to 60 backbone atoms, straight or branched arylalkynyl having from 7 to 60 backbone atoms, straight or branched alkoxy having from 2 to 60 backbone atoms, straight or branched alkenyloxy having from 3 to 60 backbone atoms, straight or branched alkynyloxy having from 3 to 60 backbone atoms, straight or branched arylalkoxy having from 7 to 60 backbone atoms, straight or branched arylalkenyloxy having from 8 to 60 backbone atoms, straight or branched arylalkynyloxy having from 8 to 60 backbone atoms, straight or branched alkylamino having from 2 to 60 backbone atoms, straight or branched alkenylamino having from 3 to 60 backbone atoms, straight or branched alkynylamino having from 3 to 60 backbone atoms, straight or branched arylalkylamino having from 7 to 60 backbone atoms, straight or branched arylalkenylamino having from 8 to 60 backbone atoms, straight or

branched arylalkynylamino having from 8 to 60 backbone atoms, straight or branched ester having from 2 to 60 backbone atoms, straight or branched carbonyl having from 1 to 60 backbone atoms;

each occurrence of R^2, R^3 and R^{12} (of n total occurrences) is each independently selected from H, halide, straight or branched alkyl having from 1 to 60 backbone atoms, straight or branched alkenyl having from 2 to 60 backbone atoms, straight or branched alkynyl having from 2 to 60 backbone atoms, straight or branched arylalkyl having from 6 to 60 backbone atoms, straight or branched arylalkenyl having from 7 to 60 backbone atoms, straight or branched arylalkynyl having from 7 to 60 backbone atoms, straight or branched alkoxy having from 2 to 60 backbone atoms, straight or branched alkenyloxy having from 3 to 60 backbone atoms, straight or branched alkynyloxy having from 3 to 60 backbone atoms, straight or branched arylalkoxy having from 7 to 60 backbone atoms, straight or branched arylalkenyloxy having from 8 to 60 backbone atoms, straight or branched arylalkynyloxy having from 8 to 60 backbone atoms, straight or branched alkylamino having from 2 to 60 backbone atoms, straight or branched alkenylamino having from 3 to 60 backbone atoms, straight or branched alkynylamino having from 3 to 60 backbone atoms, straight or branched arylalkylamino having from 7 to 60 backbone atoms, straight or branched arylalkenylamino having from 8 to 60 backbone atoms, straight or branched arylalkynylamino having from 8 to 60 backbone atoms, straight or branched ester having from 2 to 60 backbone atoms, straight or branched carbonyl having from 1 to 60 backbone atoms;

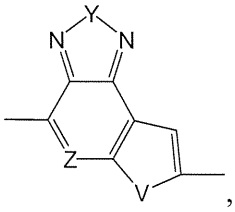
n is an integer from 10 to 1000; and

when Ar^3 is , m is 0 when Ar^1 and Ar^2 are both absent, or when Ar^1 and Ar^2 are both present, m is an integer from 1 to 1000 and the ratio of m:n is from about 0.01 to about 1;

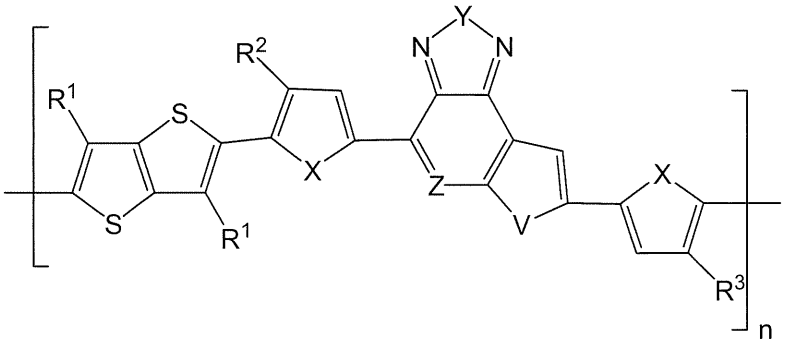
and when Ar^3 is  or , Ar^1 and Ar^2 are both present, and m is an integer from 1 to 1000 and the ratio of m:n is from about 0.01 to about 1.

2. The polymer of claim 1, wherein Ar^1 and Ar^2 are both present and the monomers containing Ar^3 and the monomers containing Ar^1 and Ar^2 are randomly arranged in the polymer.

3. The polymer of claim 1, wherein Ar^1 and Ar^2 are both present and the monomers containing Ar^3 and the monomers containing Ar^1 and Ar^2 are arranged in blocks in the polymer.

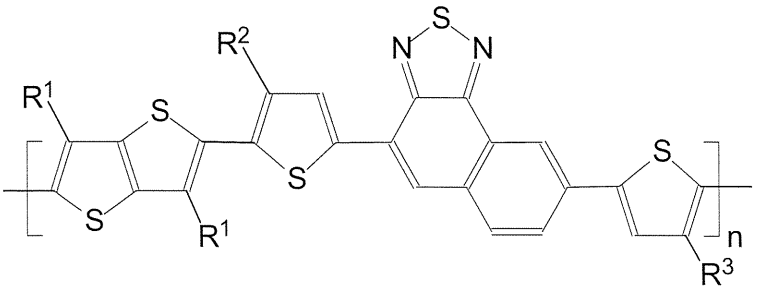
4. The polymer of claim 1, wherein Ar^3 is , Ar^1 and Ar^2 are both absent and R^1 is not H.

5. The polymer of any one of claims 1 to 4, wherein the polymer has formula I-2:

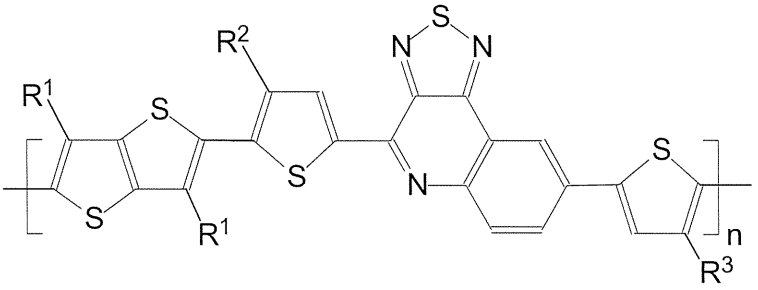


I-2

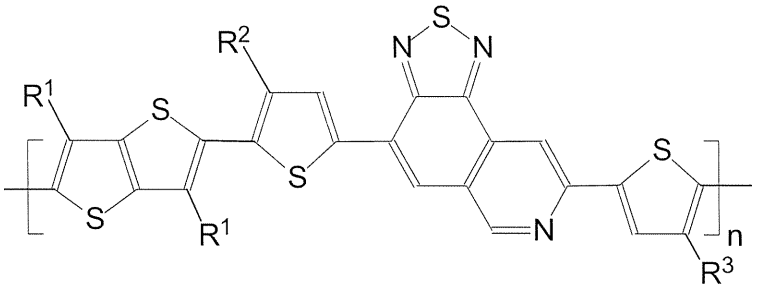
6. The polymer of claim 5, wherein the polymer has one of the following formulas:



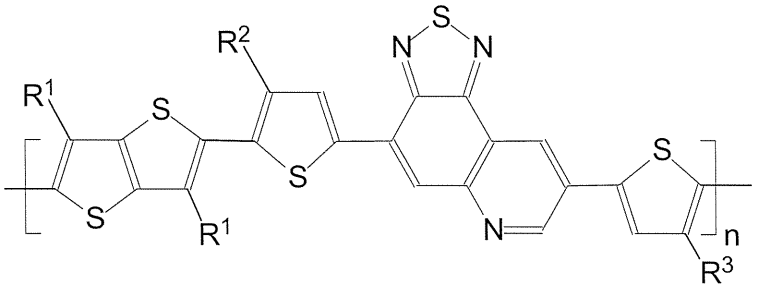
(2a)



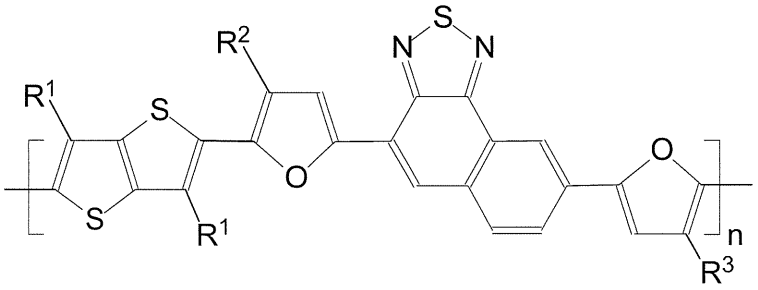
(2b)



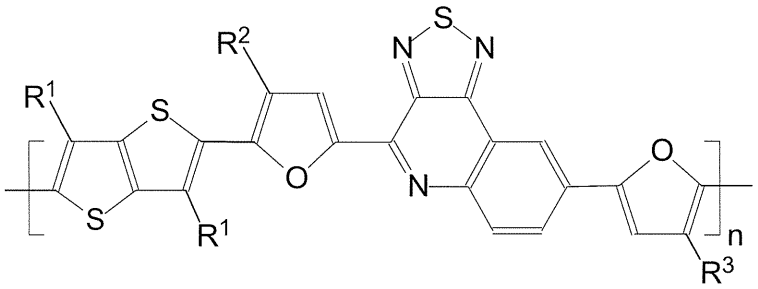
(2c)



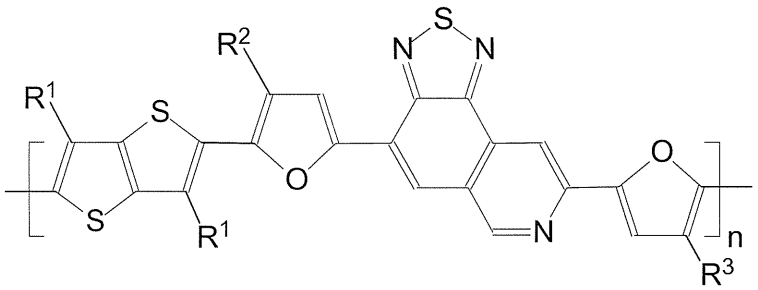
(2d)



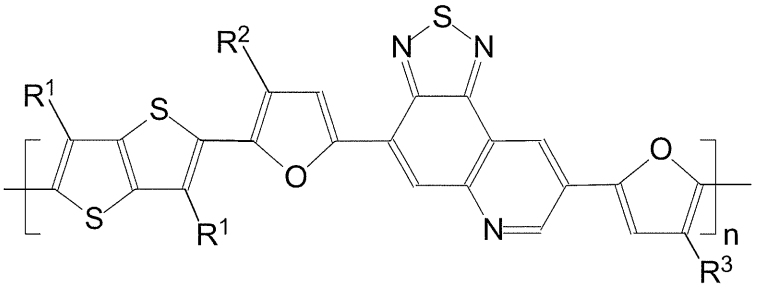
(2e)



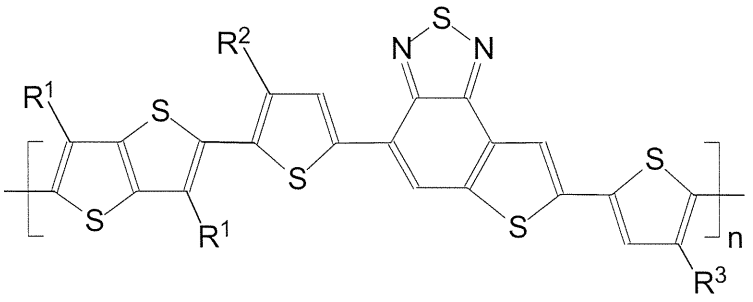
(2f)



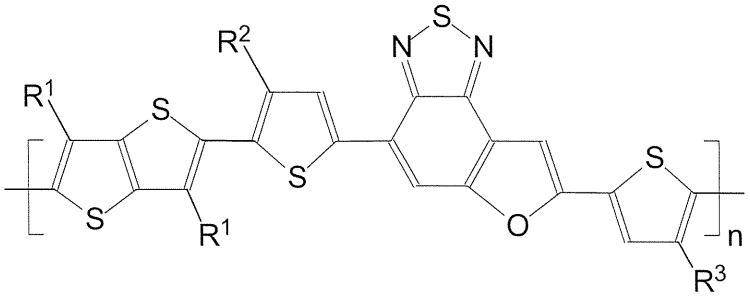
(2g)



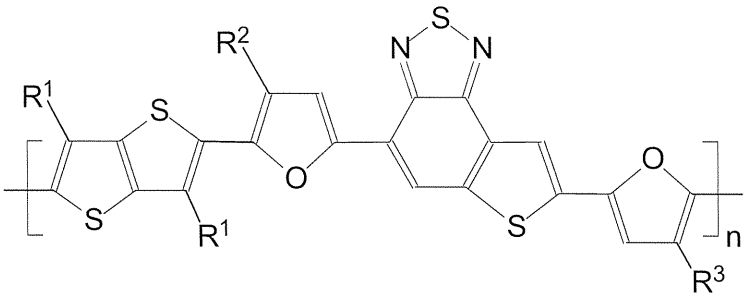
(2h)



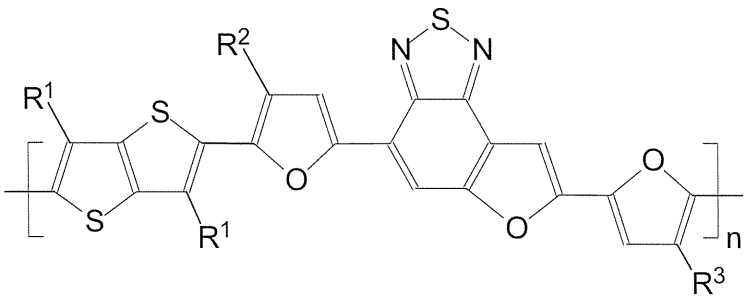
(2i)



(2j)

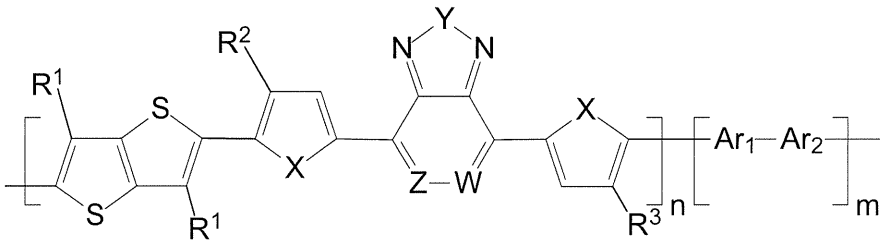


(2k)



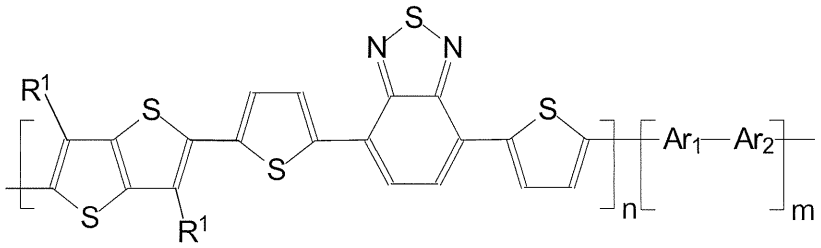
(2l)

7. The polymer of any one of claims 1 to 3, wherein the polymer has formula I-4:

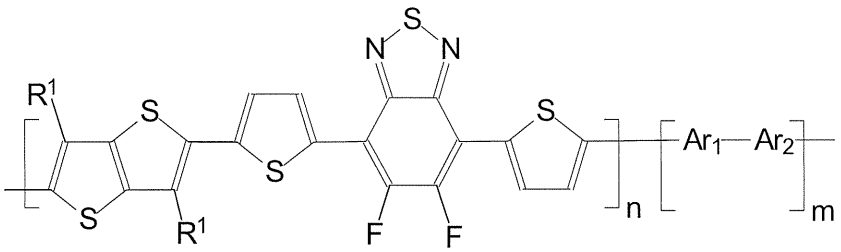


I-4

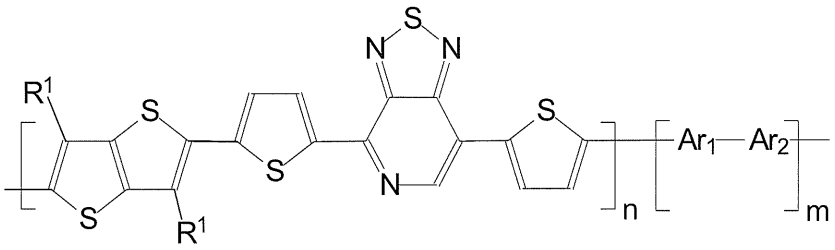
8. The polymer of claim 11, wherein the polymer has one of the following formulas:



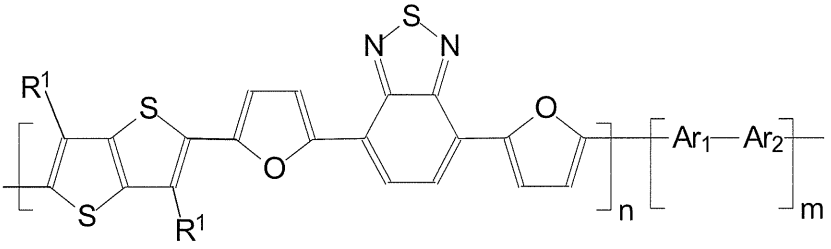
(4a)



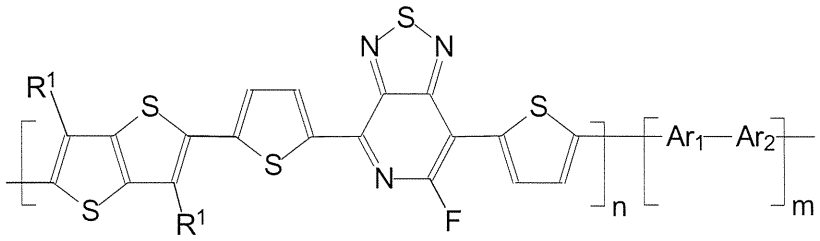
(4b)



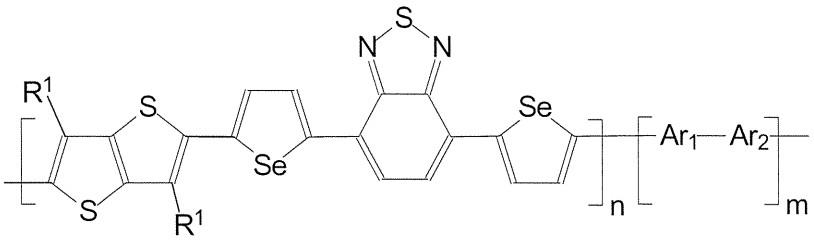
(4c)



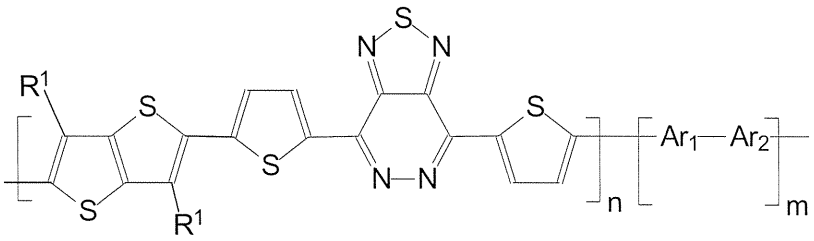
(4d)



(4e)

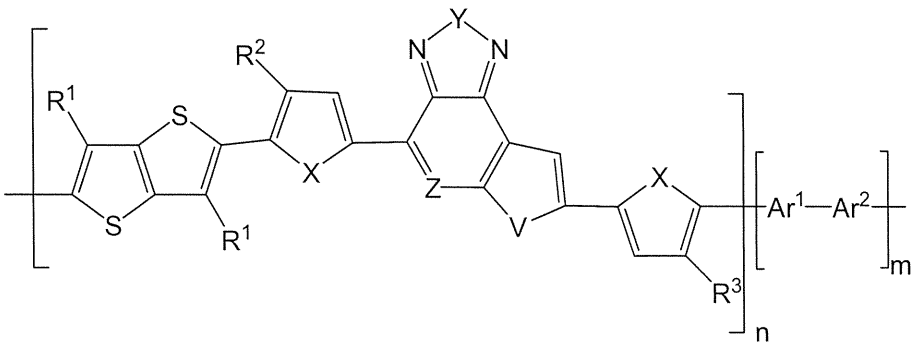


(4f)



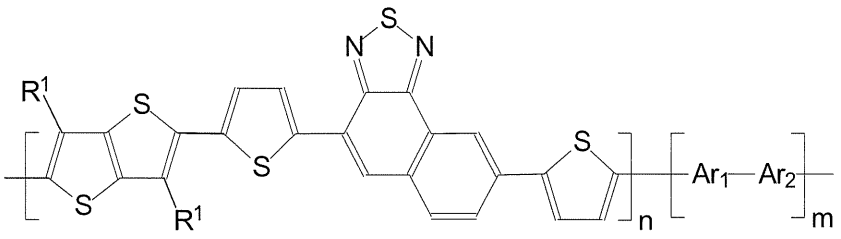
(4g)

9. The polymer of any one of claims 1 to 3, wherein the polymer has formula I-5:

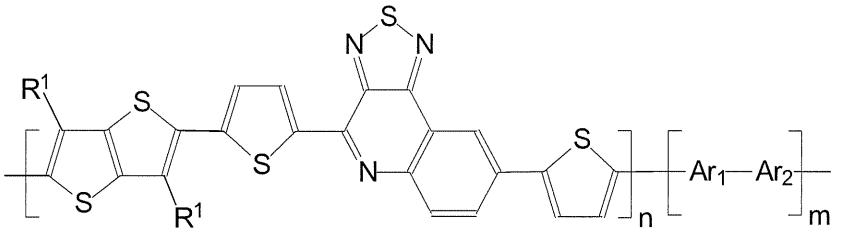


I-5

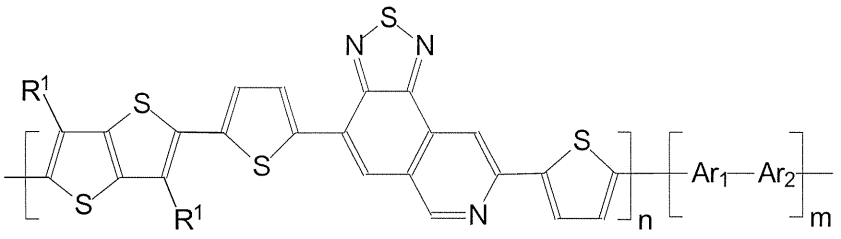
10. The polymer of claim 9, wherein the polymer has one of the following formulas:



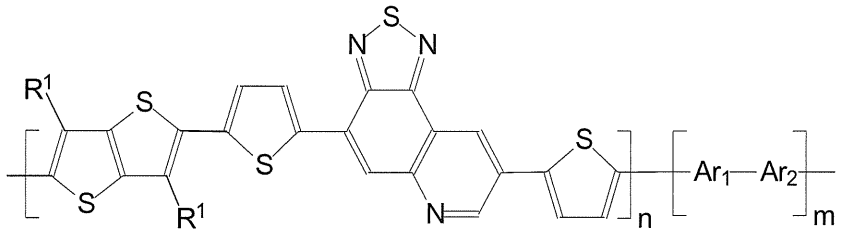
(5a)



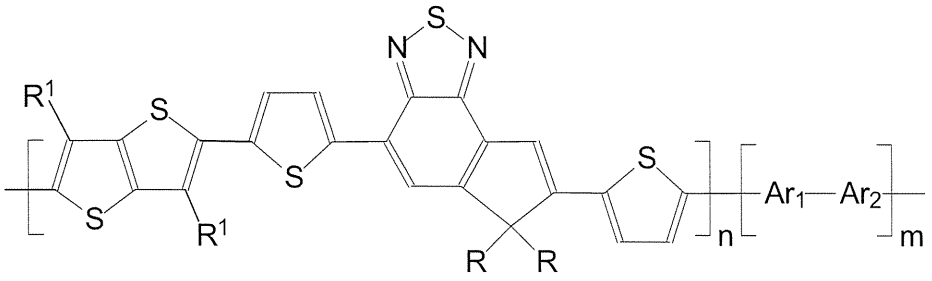
(5b)



(5c)

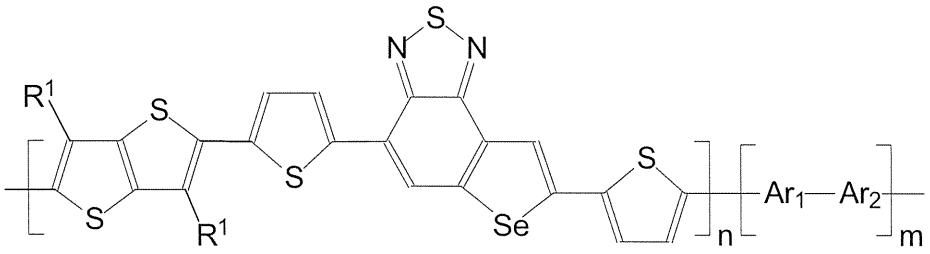


(5d)

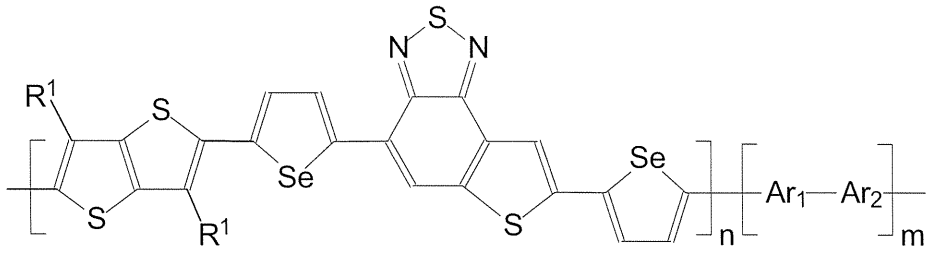


(5e)

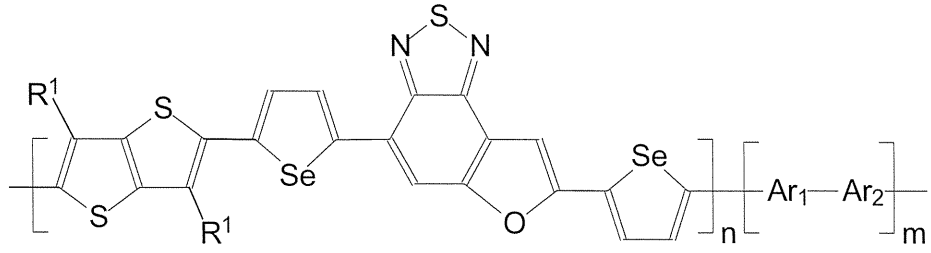
R: alkyl group, or R,R=O



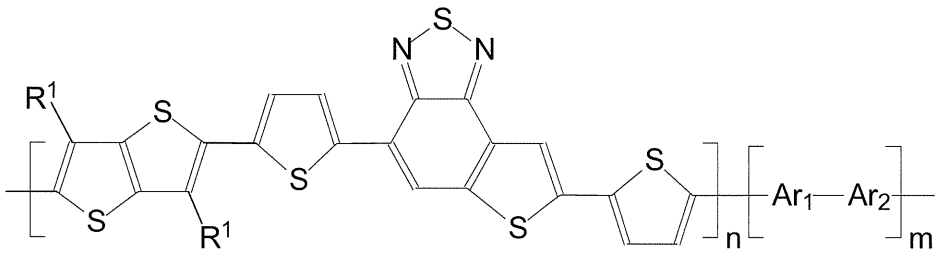
(5f)



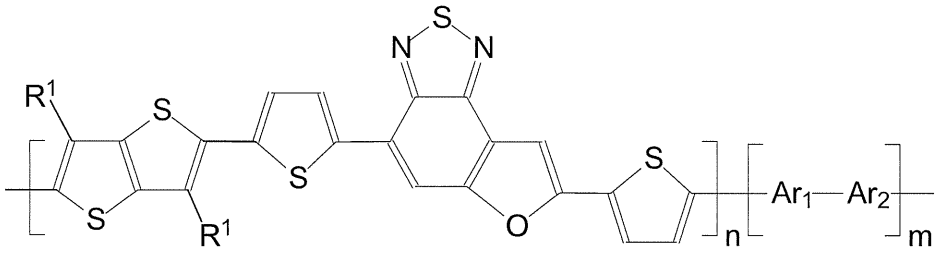
(5g)



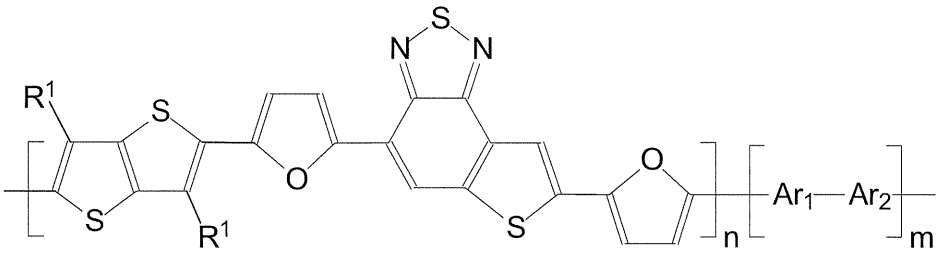
(5h)



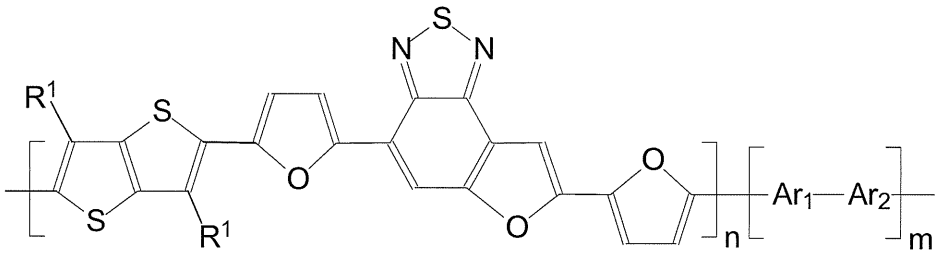
(5i)



(5j)

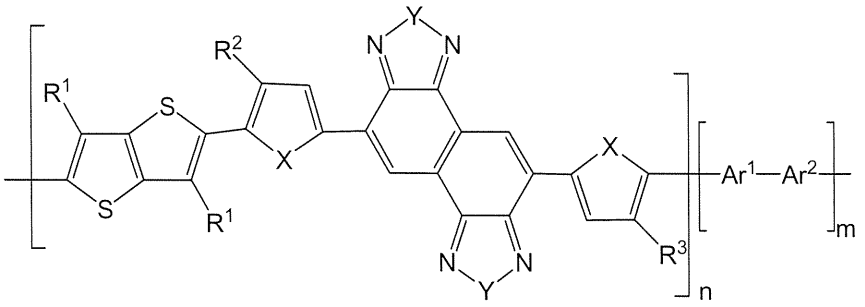


(5k)



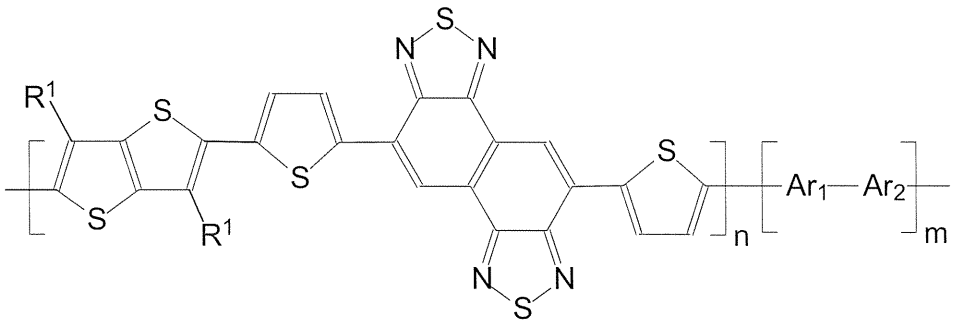
(5l)

11. The polymer of any one of claims 1 to 3, wherein the polymer has formula I-6:

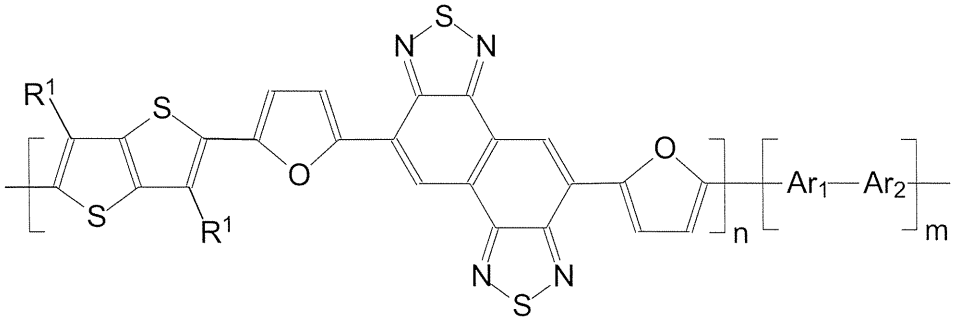


I-6

12. The polymer of claim 11, wherein the polymer has one of the following formulas:



(6a)



(6b)

13. A solution comprising the polymer of any one of claims 1 to 12 dissolved in a halogen-free solvent.

14. A thin film comprising the polymer of any one of claims 1 to 12.

15. The thin film of claim 14, further comprising an n-type acceptor material.

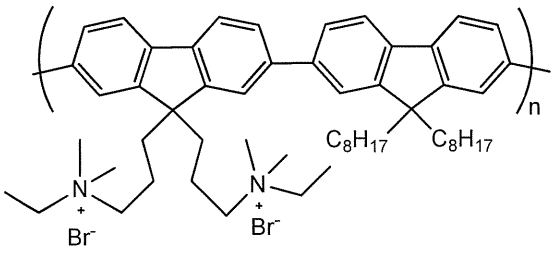
16. The thin film of claim 15, wherein the n-type acceptor material comprises [6,6]-phenyl-C_{60}-butyric acid methyl ester (PC61BM), [6,6]-phenyl-C_{70}-butyric acid methyl ester (PC71BM), 2-vinyl-4,5-dicyanoimidazoles, or a perylene tetracarboxylic diimide.

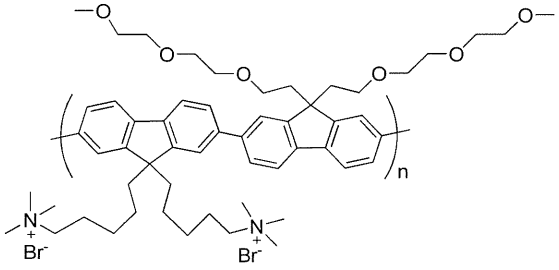
17. An organic electronic device comprising a photoactive layer, the photoactive layer comprising the polymer of any one of claims 1 to 12.

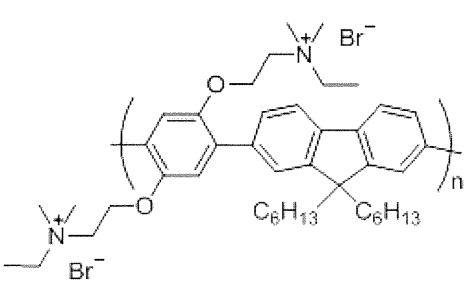
18. The organic electronic device of claim 17, wherein the device comprises an organic photovoltaic cell having normal or inverted architecture, an organic thin film transistor, a photodiode, a light-emission diode, or a sensor including a chemical sensor, a biosensor or a biochemical sensor.

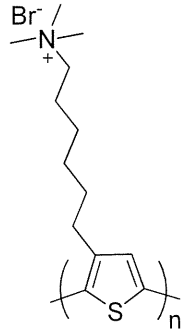
19. The organic electronic device of claim 17, further comprising a polymeric electrolyte interlayer between the photoactive layer and a cathode.

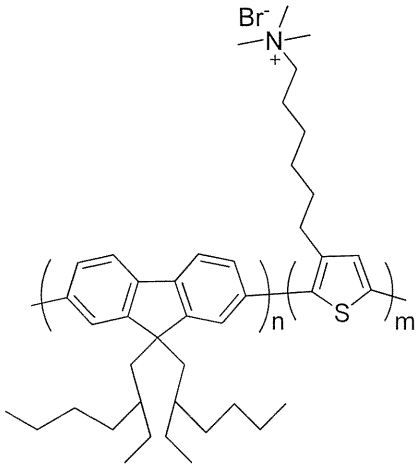
20. The organic electronic device of claim 19, wherein the polymeric electrolyte interlayer comprises a polymer electrolyte selected from:











wherein in the above formulas for the polymer electrolyte, m and n are integers independently selected from 10 to 1000.

21. A process for forming a thin film of any one of claims 14 to 16, comprising:

dissolving a polymer of any one of claims 1 to 12 in a halogen-free solvent to form a solution;

applying the solution to a substrate; and

allowing the solution to dry to form a thin layer comprising the polymer.

22. The process of claim 21, wherein the thin layer is included in an organic electronic device.

23. The process of claim 22, wherein the organic electronic device is an organic electronic device of any one of claims 17 to 20.

24. The process of any one of claims 21 to 23, wherein said applying comprises spin coating, spray coating, slot die coating, blade coating, inkjet printing, or gravure printing.