CLAIMS

1. A sensor for sensing an analyte, the sensor comprising:

a detection sensing element having a resistance variable with an amount of optical light received by the detection sensing element;

a control sensing element having a resistance variable with an amount of optical light received by the control sensing element;

a detection optical element for contacting the analyte, said detection optical element configured to transmit a first amount of optical light received by the detection optical element to the detection sensing element when the detection optical element is in contact with the analyte;

a control optical element for contacting a control medium, said control optical element configured to transmit a second amount of optical light received by the control optical element to the control sensing element when the control optical element is in contact with the control medium;

a voltage source in electrical connection with the detection sensing element and the control sensing element, the voltage source configured to generate a voltage potential at a node between the detection sensing element and the control sensing element, the voltage potential at the node based on a ratio of a potential difference across the detection sensing element and the potential difference across the control sensing element; and

a voltage readout device configured to measure the voltage potential of the node based on the resistance of the detection sensing element when the first amount of optical light is received by the detection sensing element, with respect to the resistance of the control sensing element when the second amount of optical light is received by the control sensing element, thereby sensing said analyte.

2. The sensor according to claim 1,

wherein the detection sensing element and the control sensing element are connected in series.

3. The sensor according to claim 1,

wherein the detection optical element is a first portion of a colour filter and the control optical element is a second portion of the colour filter; and

wherein the first portion of the colour filter covers the detection sensing element and the second portion of the colour filter covers the control sensing element.

4. The sensor according to claim 3,

wherein the colour filter comprises a conjugated polymer or molecule, or an indicator dye.

5. The sensor system according to claim 1,

wherein the analyte is isolated from the control optical element by the control medium.

6. The sensor according to claim 1,

wherein the detection sensing element comprises a detection photoconductor; and

wherein the control sensing element comprises a control photoconductor.

7. The sensor according to claim 6,

wherein the detection photoconductor comprises a pair of interdigitated electrodes and a coating of organic photoconductive material over the pair of interdigitated electrodes.

8. The sensor according to claim 7,

wherein the organic photoconductive material is any one selected from a group consisting of fullerene derivatives, semiconducting polymers or molecules, thiophenes, phthalocyanides, squaraines, azo pigments, and parylene pigments.

9. The sensor according to claim 6,

wherein the control photoconductor comprises a pair of interdigitated electrodes and a coating of organic photoconductive material over the pair of interdigitated electrodes.

10. The sensor according to claim 9,

wherein the organic photoconductive material is any one selected from a group consisting of fullerene derivatives, semiconducting polymers or molecules, thiophenes, phthalocyanides, squaraines, azo pigments, and parylene pigments.

11. The sensor according to claim 1, further comprising:

an optical source configured to generate optical light.

12. The sensor according to claim 1,

wherein the detection optical element is configured to transmit the first amount of optical light based on a pH of the analyte; and

wherein the control optical element is configured to transmit the second amount of optical light based on a pH of the control medium.

13. The sensor according to claim 1,

wherein said sensor is a printed sensor.

14. A method of sensing an analyte, the method comprising:

providing a detection sensing element having a resistance variable with an amount of optical light received by the detection sensing element;

providing a control sensing element having a resistance variable with an amount of optical light received by the control sensing element;

electrically connecting a voltage source to the detection sensing element and the control sensing element, the voltage source configured to generate a voltage potential at a node between the detection sensing element and the control sensing element, the voltage potential at the node based on a ratio of a

potential difference across the detection sensing element and the potential difference across the control sensing element;

contacting a detection optical element with the analyte, said detection optical element configured to transmit a first amount of optical light received by the detection optical element to the detection sensing element when the detection optical element is in contact with the analyte;

contacting a control optical element with a control medium, said control optical element configured to transmit a second amount of optical light received by the control optical element to the control sensing element when the control optical element is in contact with the control medium;

providing optical light to the detection optical element and the control optical element so that the detection optical element transmits the first amount of optical light to the detection sensing element and the control optical element transmits the second amount of optical light to the control sensing element; and

sensing said analyte by measuring the voltage potential of the node, the voltage potential of the node based on the resistance of the detection sensing element when the first amount of optical light is received by the detection sensing element, with respect to the resistance of the control sensing element when the second amount of optical light is received by the control sensing element.

15. The method according to claim 14, further comprising:

providing an optical source to generate the optical light.

16. A method of fabricating a sensor for sensing an analyte, the method comprising:

providing a detection sensing element having a resistance variable with an amount of optical light received by the detection sensing element;

providing a control sensing element having a resistance variable with an amount of optical light received by the control sensing element;

providing a detection optical element for contacting the analyte, said detection optical element configured to transmit a first amount of optical light received

by the detection optical element to the detection sensing element when the detection optical element is in contact with the analyte;

providing a control optical element for contacting a control medium, said control optical element configured to transmit a second amount of optical light received by the control optical element to the control sensing element when the control optical element is in contact with the control medium;

providing a voltage source in electrical connection with the detection sensing element and the control sensing element, the voltage source configured to generate a voltage potential at a node between the detection sensing element and the control sensing element, the voltage potential at the node based on a ratio of a potential difference across the detection sensing element and the potential difference across the control sensing element;

and

providing a voltage readout device configured to measure the voltage potential of the node based on the resistance of the detection sensing element when the first amount of optical light is received by the detection sensing element, with respect to the resistance of the control sensing element when the second amount of optical light is received by the control sensing element, thereby sensing said analyte.