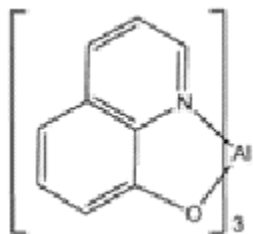
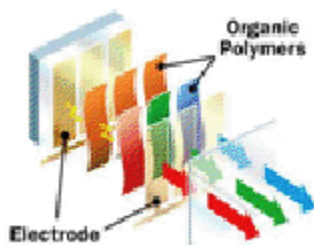


ORGANIC LIGHT EMITTING DIODES (OLEDs)



Organic LED's or Organic light emitting diodes (OLED) are based on small molecules that emit light when an electric current flows through them. These Small molecules were first developed by Dr. Ching W. Tang (A Chinese American Physical Chemist). An Organic LED's PN junction is made from an organic molecule compounds such as: Alq3 (Aluminum tris (8-hydroxyquinoline)) and diamine (TPD).

A simple OLED consists of a fluorescent organic layer sandwiched between two metal electrodes (Anode & Cathode). Under applications of an electric field, electrons and holes are injected from the two electrodes into the organic layer, where they meet to produce light.



This technology is very useful for applications in flat panel displays that provide visual imagery that is easy to read, vibrant in colours and less consuming of power. OLEDs are light weight, durable, power efficient and ideal for portable applications.

In OLEDs low-cost materials used than LCD displays. An OLED display works without a backlight. Thus, it can display deep black levels and can be thinner and lighter than a liquid crystal display (LCD). In low ambient light conditions such as a dark room an OLED screen can achieve a higher contrast ratio than an LCD.

OLEDs can replace the current LCD technology in many applications due to following reasons:

Greater brightness

Faster response time for full motion video

Wide viewing angles

Light weight

Greater environmental durability

More power efficiency

Wide operating temperature ranges

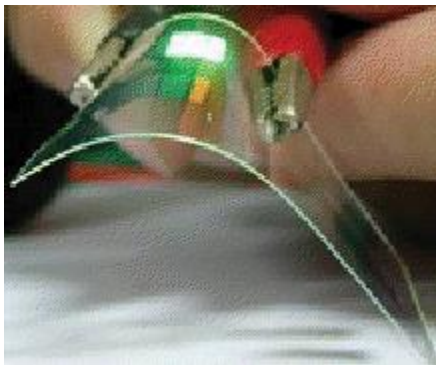
Much cost-effectiveness

Limitations:

Performance of organic LEDs depend upon many parameters such as electron and hole mobility, magnitude of applied field, nature of hole and electron transport layers and excited life-times.

The future:

Organic Light Emitting Diodes are evolving as the next generation of light sources. Organic full-colour displays may eventually replace liquid crystal displays for use with lap top and even desktop computers. Researches are going on this subject and it is sure that OLED will emerge as future solid state light source.



Basic Differences between Simple LED & OLEDs :

Different materials are used to manufacture each of the technologies. OLEDs are created by using organic semiconductors, including polymers and so-called small molecules, while LEDs are constructed using inorganic III-V materials such as gallium nitride (GaN).

There are also visible differences in the way each generates light. OLEDs, which can be applied to flat panels (like glass or plastic substrates), emit an even illumination over an entire surface. LEDs, which are cut up and packaged into essentially miniature bulbs, generate brilliant points of light.

The thin, flat characteristic of OLED substrates lends itself to diffused lighting which used in applications like smart phones, flat TV screens and MP3 players, making them more energy efficient, brighter and easier to read & on other side simple LEDs create sharp beams or single points of light used in industrial home lighting & display backlighting applications.

Source : <http://www.udaiportalents.com/technical-learning/organic-light-emitting-diodes-oleds>