THIN FILM TRANSISTORS WITH ORGANIC-INORGANIC HYBRID MATERIALS AS SEMICONDUCTING CHANNELS

ABSTRACT

An FET structure in accordance with the invention employs an organic–inorganic hybrid material (32) as the semiconducting channel between source (34) and drain electrodes (36) of the device (30). The organic-inorganic material combines the advantages of an inorganic, crystalline solid with those of an organic material. The inorganic component forms an extended, inorganic one-, two-, or three-dimentional network to provide the high carrier mobilities characteristic of inorganic, crystalline solids. The organic component facilitates the self-assembly of these materials and enables the materials to be deposited by simple, low temperature processing conditions such as spin-coating, dip-coating, or thermal evaporation. The organic component is also used to tailor the electronic properties of the inorganic framework by defining the dimensionality of the inorganic component and the electronic coupling between inorganic units.

FIG 3