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(54) **ELECTRONIC DEVICES AND METHODS USING MOLECULAR-BRIDGED METAL NANOPARTICLES**

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(52) **U.S. Cl.** **359/328; 257/E21.404; 257/E29.322; 257/E51.023; 977/DIG. 1**

(58) **Field of Search** 359/326, 328; 257/E21.404, E29.322, E51.023; 435/6, 7.1; 436/518, 525; 385/326, 328

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(57) **ABSTRACT**

A molecule is wired into an electronic circuit by attaching a metal nanoparticle to the molecule and then electrically connecting a metal nanoparticle to the electric circuit. The metal nanoparticle interconnects can bridge the gap between small molecules and conventional electric circuits. An optical second harmonic also may be generated by impinging optical radiation having a first frequency on an array of molecularly bridged metal nanoparticles, to generate optical energy at a second frequency that is twice the first frequency. Red to blue light conversion thereby may be provided.

28 Claims, 13 Drawing Sheets

