

Biomaterial-Based Ir Detection

Ö. Yavuz and M. Aldissi

Fractal Systems, Inc., 200 9th Avenue North, Suite 100, Safety Harbor, FL 34695, USA

maldissi@fractalsystemsinc.com

This effort focused on the use of crustacyanin protein extracted from the lobster shell in IR detection and imaging applications. In addition to the protein's excellent reversible thermo-active response in the IR region of interest, electrical characteristics versus temperature showed that the protein can be used as an electro-optic thermal sensing device as well. The high sensitivity and fast response of the protein layer was further enhanced by the deposition process we used. The thin coatings were prepared by Langmuir-Blodgett and self-assembly techniques. Furthermore, the protein exhibited temperature variation under Ti:Sapphire laser excitation at different wavelengths in ambient environment. We have also shown that the protein exhibits fluorescence properties after exposure to IR heat. Stability of the protein, which is important in this type of application, was also demonstrated using the different characterization techniques after repeated heating/cooling cycles. We can conclude that this protein represents a formidable candidate for the fabrication of IR sensors and microbolometers for uncooled IR imaging applications.