HIGHLY TRANSPARENT AND ELECTRICALLY CONDUCTIVE POLYMER-BASED NANOCOMPOSITE FILM

TECHNICAL FIELD
Solar Absorbing Material

APPLICATION
This invention is a highly transparent and electrically conductive polymer-based nanocomposite film.

DESCRIPTION
This invention is a highly transparent and electrically conductive polymer-based nanocomposite film with outstanding rubbery plateau modulus. Through use of a four-point-probe, the film’s conductivity measures values of up to 125 S/cm. The film’s transparency values range from 96.8% to -80% in the visible and near infrared region between 320 nm and 1000 nm. Moreover, the film can withstand temperatures as hot as 406°C. Remarkable modulus enhancement of 11,000, 52,000 and 400,000% was obtained in the rubbery plateau region for composite films containing 1.18, 6.12 and 28.08 vol.% of graphene sheets. These films are suitable for photovoltaic solar technology, PEMFC bipolar plates, conducting anode in lithium batteries, super capacitors and most importantly as replacement for Indium Tin Oxide (ITO), which is used in electronic display devices. The advantages of the film are its low cost, ease of processing, acid-base resistance, highly thermal and electrical conductivity, optically transparency, flexibility, mechanical strength, durability, and ability to withstand extreme thermal environments.

ADVANTAGES
• Highly transparent
• Highly electrically conductive
• Easily Processable

INVENTOR
Dr. Jude O. Iroh, Ph.D.
Professor
Materials Science and Engineering

STATUS
US provisional patent application filed with USPTO on November 8, 2011

CONTACT
Ellen Banks, JD
Licensing Associate
ellen.banks@uc.edu
513.558.4768