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Research Interests

◆ Nanodevice-Fabrication Technologies

(Opto-)Electronics and Information Industry

1. **Large-Area Flat Panel Display Nanowire Transistors**
(Transparent, High mobility, Atmospheric Manufacture)
2. **Nanowire Light-Emitting Diodes**
(Low Cost, Robust, Large Area)
3. **Light Emitting Diode Displays**
(Ultimate Displays – Long Life, High Brightness, Very Thin)
4. **Nanowire Solar Cells**
(Robust, High Efficiency, Cheap, Green)
5. **Optoelectronic Integrated Circuits (OEIC)**
(Combination of III-V (InGaN) and Si in a single chip)

◆ Flexible Devices and Displays Technologies

Mobile Information Industry

1. **Roll-to-Roll Printing Technology for Patterning of Flexible Devices**
(Flexible Displays, RFID, E-Paper, etc.)
2. **Self-Assembly Technology for Seamless Imprint Mold Fabrication**
(Low Cost and Easy Fabrication)
3. **Transparent Conductive Plastic Film**
(Bendable, Endurable, Low Cost, High Conductivity and Transparency)
4. **Organic Light Emitting Diode Devices and Flexible Memory Devices**
(Single-layer Organics, High Efficiency)
5. **Antireflective Optical Films and Biomimetic Devices**

◆ Plasma Technologies and Thin Film Deposition

Information, Mechanical, Optics and Energy Industries

1. **Atmospheric Plasma**
(Deposition, Treatment and Etching)
2. **Novel High-Density Plasma Generation**
(Low Cost, Large Area and Easy Fabrication)
3. **Functional Thin Films**
(Super-tough Nanocomposite Films, Carbon Nanotubes, Silicon Carbide, Cubic Boron Nitride, Diamond-Like Carbon, Nanodiamond, etc.)

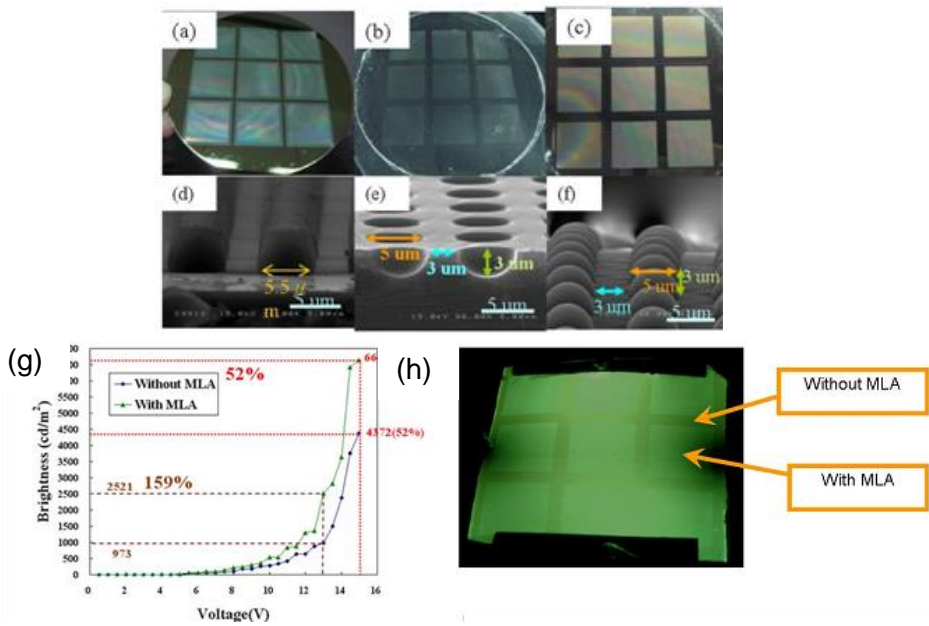
◆ Functional Nanocomposite Coatings Technologies

Touch Panel, Mobile, Mechanical Industries

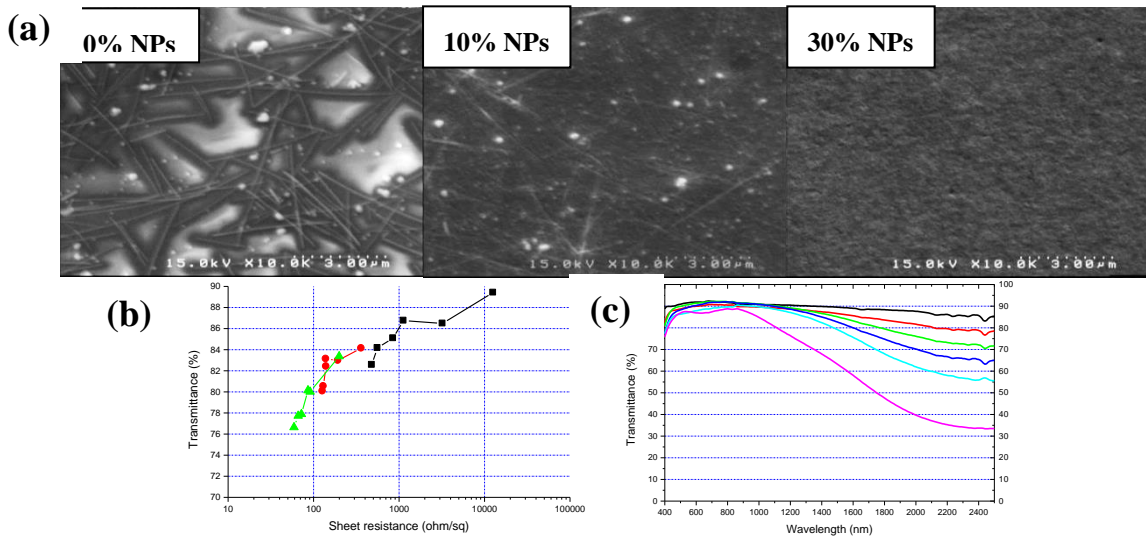
1. **Transparent Nanocomposite Hard Coatings**
(Super-tough, High Transparency, Low Cost, Large Area and Easy Fabrication)
2. **Transparent and Conductive Nanocomposite Coatings**
(Bendable, Endurable, Low Cost, High Conductivity and Transparency, Smooth, Large Area and Easy Fabrication)

Representative Publications

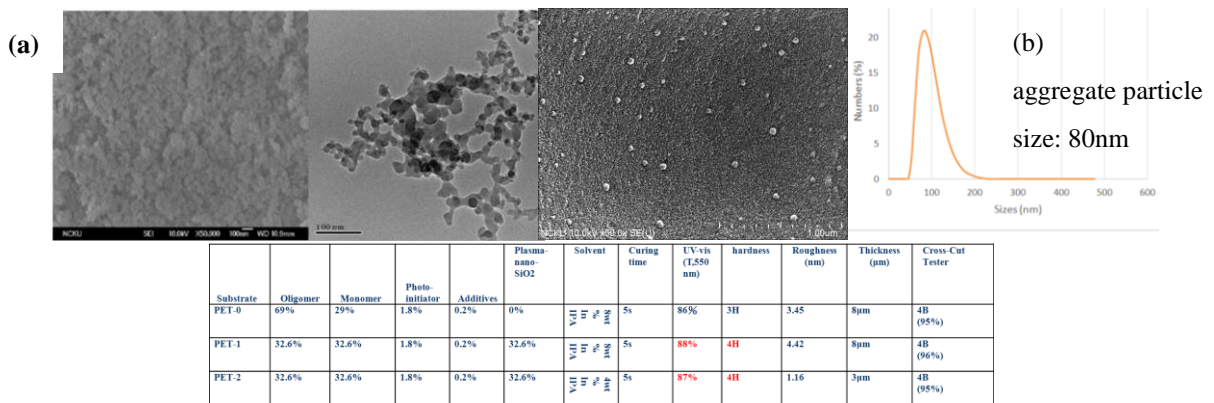
1. Yu-Chih Kao, **Franklin Chau-Nan Hong***, 2013, "Selective electroless plating of silver nanograting patterns with no lateral growth for the fabrication of polarizers", v231, p460, Surface & Coatings Technology.
2. Tung-Hsien Wu, **Franklin Chau-Nan Hong***, 2013, "Suppressing the lateral growth of gallium nitride nanowires by introducing hydrogen plasma", v529, p133, Thin Solid Films.



(a-f) Photographic and SEM images of 5µm pattern Si and PDMS mold;
 (g-h) Luminance-Voltage curve and photographic image of OLED with microlens array.



(a) SEM images, (b) transparency vs. sheet resistance and (c) spectral transmittance in visible-IR region of metal nanowires and inorganic nanoparticles composite coatings



(a) SEM images, (b) size analysis of high hardness nanoparticles.
 The table is the characteristics of nanocomposite coatings.