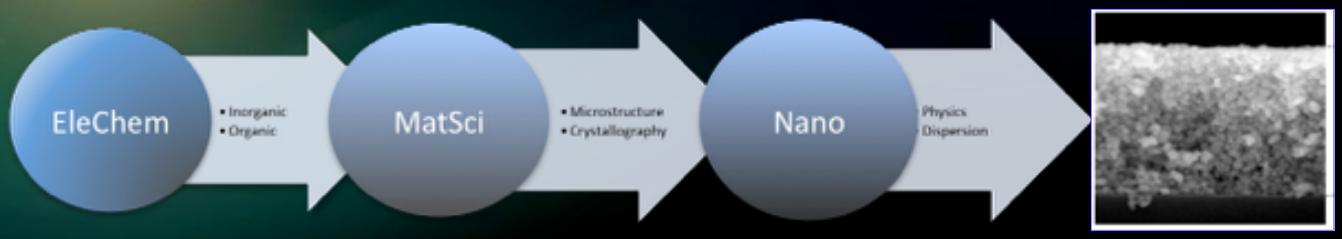

MQ corporation
molecular quartermasters
renewable liquid power for mankind

Solar energy power delivered through a liquid coating !

Not a panel, not a film, not an ink…



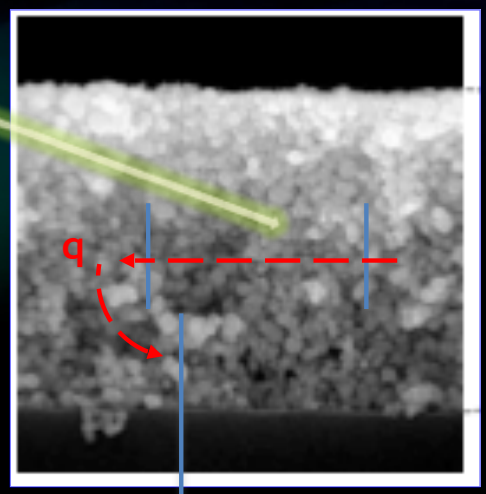
MQ's charged SLP coating as seen through a Scanning Electron Microscope (SEM) at 10nm resolution scale

THE GAME CHANGING SCIENCE OF SOLAR POWER

Solar Liquid Power voltaic Physics

Light adsorption and charge generation

$E_g = hc/\lambda = qV_g$



Charge transport by drift and diffusion

$I = qv = n\mu\nabla E + q D \nabla n$

Photovoltaic current and voltage as unlimited power source $P = IV$

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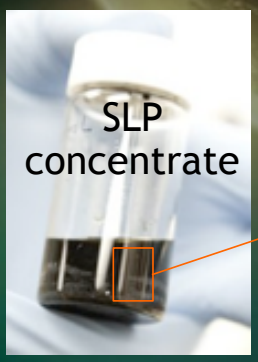
Electrochemistry-NanoScience Based SLP Development Tree



SOLAR LIQUID POWER (SLP)
(pigment, binder and carrier mixture in liquid form)

SOLAR LIQUID POWER (SLP, pigment and binder coating in dried form)
-Pigment to binder above percolation threshold concentration such that SLP is marginally semiconducting and photovoltaic.
-Enhance photovoltaic conversion efficiency through size and bandgap engineering of pigment nanoparticles (i.e., taking advantage surface/volume enhancement).
-Enhance electrical and thermal conductivity of SLP-LLD platform by mixing with small metal particles (such as Ni) and bins use across the full light spectrum

PIGMENT
-Use industry standard base filler such as TiO_2 nanoparticles which is a high bandgap (~3.2eV) semiconductor.
-Reduce TiO_2 bandgap (to ~1.6eV) adsorb visible light.
-Bandgap reduction can be achieved by bulk doping with metals (such as Ga).
-Bandgap reduction may also be achieved by surface modification (such as carbonization or nitridation).

BINDER
-Use Industry standard acrylic polymer resin such as based on PMMA and/or PVA particles.

CARRIER
-Use Industry standard and environmentally friendly solvents such as water.

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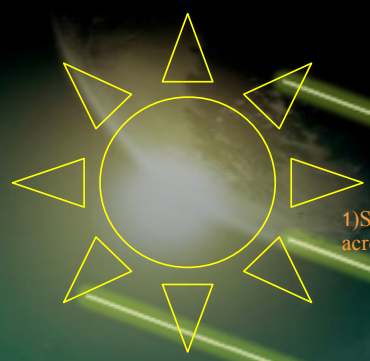
SLP/LLD Electrochemical Cycle

Solar liquid power/liquid lipid diode



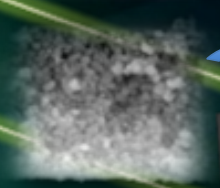
1)SLP molecules "adsorb" sunlight across entire light spectrum

2)SLP molecules change shape in this excited state

3)Energy ΔH per SLP molecule stored in chemical and nano bonds

Light adsorption and charge generation

$E_g = hc/\lambda = qV_g$



Ground State SLP

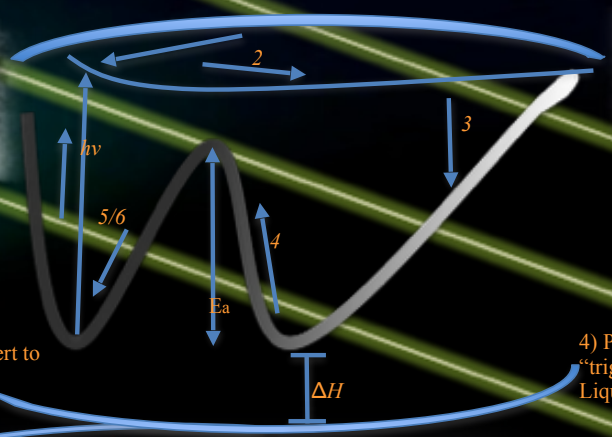


Photo-excited state SLP

6) SLP molecules revert to ground state

4) Photo excitation chemical "trigger" releases energy to Liquid Lipid Diode

Charge transport by drift and diffusion

$I = qv = n\mu\nabla E + q D \nabla n$

ΔH

5) Stored solar liquid power is released as usable electricity

Photovoltaic current and voltage as unlimited power source $P = IV$

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Solar Liquid Power vs Solar Panel Power

Comparative Analysis

Solar Panels are fixed objects pointing towards the waking sun on roof tops or buildings at an approx 41.8° angle to obtain the highest efficiency (~13.7%) within their "single light spectrum" from 0700 through 1600hrs (highest is Solar Zenith). Absorption acceleration is gradual towards solar zenith.

7 8 9 10 11 SZ 1 2 3

SOLAR PANEL power hours

SOLAR LIQUID POWER (SLP) power hours 0500 0600 0700 0800 0900 1000 1100 SZ 1300 1400 1500 1600 1700 1800 1900

Solar Liquid Power (SLP) IS NOT a fixed object like a panel. It is a coating which does not follow conventional barriers. Light is instantly absorbed earlier from the Sun and from all angles because we have tuned the electrochemistry and nano-particles to cross the light spectrum, achieving much higher efficiencies (40%+), longer light spectrum availability, and produce at least 275% + more power depending on standard environmental conditions.

Photovoltaic current and voltage as unlimited power source $P=IV$ (1)

Light adsorption and charge generation $Eg=hc/\lambda = qVg$

(1) SLP molecules "adsorb" sunlight across entire light spectrum (UVA, UVB, UVC, Visible, and IR) to extend light absorption and support high 40% efficiency numbers

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