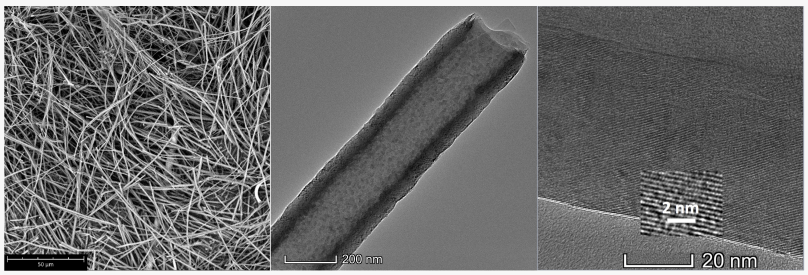
Dramatic advance in the technology to fight global warming

CALGARY , ALBERTA, CANADA, August 30, 2019 /EINPresswire.com/ -- A study released today in Materials Today Sustainability provides a several hundred-fold advance in stopping the release of the greenhouse gas carbon dioxide. This advance provides a path to not only slow the rate CO2 rises, but actually decrease the level of that greenhouse gas in the atmosphere. C2CNT refers to CO2 to carbon nanotubes. The study, “Amplified CO2 reduction of greenhouse gas emissions with C2CNT carbon nanotube-composites”, authored by C2CNT founder Dr. Stuart Licht and the C2CNT team, outlines the C2CNT process and its utilization of CO2 to produce carbon nanotubes (CNTs). Carbon nanotubes or CNTs are the strongest material ever measured. The addition of CNTs to structural materials greatly increases their strength and decimates their carbon footprint. For example, as reported in the study 1 ton of CNT stops emission of over 800 tons of CO2 as a CNT-cement composite.



Carbon nanotubes grown by C2CNT directly from carbon dioxide (SEM and TEM imaging). Right. The carbon nanotube wall showing the cylindrical layers of graphene comprised of individual carbons. (credit, S. Licht, C2CNT)

> Our ‘Diamonds from the sky’ technology transforms anthropogenic CO2 into valuable carbon nanomaterials and composites to mitigate greenhouse gases and pioneer a carbon economy to stop global warming.”
>
> *Stuart Licht*

One ton of CNT can also avoid:

1. 4400 tons of CO2 in aluminum production,
2. 2750 tons of CO2 in titanium production,
3. 1800 tons of CO2 in magnesium production, or
4. 300 tons of CO2 in steel production.

In this discovery of the C2CNT-composite process, carbon nanotubes are produced by a process called electrolysis at low cost. Then the CNTs are mixed with the structural material. In addition to the CO2 reduction using the CNT-composites, a further reduction occurs from the 4 tons of CO2 consumed in making the CNTs (CO2 is the only material consumed to produce the CNTs and the only two products are pure carbon CNTs and oxygen). C2CNT is a Finalist competing in the Carbon XPRIZE competition (www.CarbonXprize.org, www.C2CNT.com). As part of the XPRIZE competition, C2CNT is testing their technology with natural gas power plant flue gas at demonstration scale at the Alberta Carbon Conversion Technology Centre located in Calgary, Canada.

The new C2CNT-composite process would allow for example the entire greenhouse gas emission of a fossil fuel power plant to be offset with a small, onsite C2CNT plant producing carbon nanotubes. C2CNT has previously demonstrated the production of carbon nanotubes not only from flue gas, but also directly from the air (direct air carbon capture without any need to first concentrate the CO2), and determined that an area equal to 4% of the Sahara Desert is sufficient to terraform the CO2 concentration (engineer the atmosphere) back to pre-industrial levels in ten years.

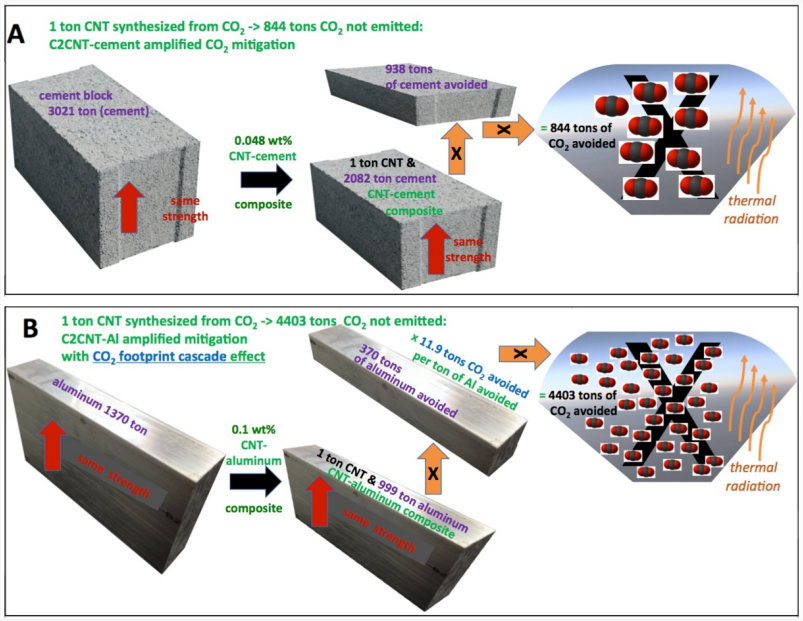
Massive consumption and removal of CO2 can minimize the species extinction, disruption to the global economy, climate change hurricanes, floods and droughts and prevent global warming from changing life as we know it. C2CNT is on path to a nanocarbon based economy aimed at changes comparable to the introduction of the plastics economy. The nanocarbon economy consumes CO2 and improves common products, such as more powerful batteries, taller buildings, stronger bridges, lighter vehicles and airplanes, bullet & shock proof thin clothing and through carbon nanomaterials made from CO2.

The study is at:
Materials Today Sustainability: "Amplified CO2 reduction of greenhouse gas emissions with C2CNT carbon nanotube-composites" by Licht, Liu, Licht, Wang, Swesi and Chan, available at: https://doi.org/10.1016/j.mtsust.2019.100023

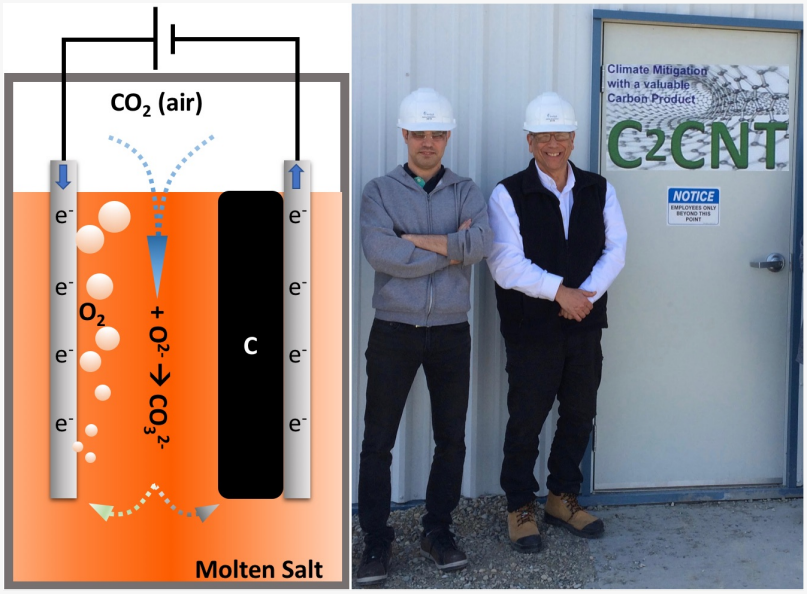
Further details are in the galley proofs available by email request to info@C2CNT.com

Read more at:
Journal of CO2 Utilization: "Exploration of alkali cation variation on the synthesis of carbon nanotubes by electrolysis of CO2 in molten carbonates" by Wang, Liu, Licht, Wang, and Licht, available at: https://doi.org/10.1016/j.jcou.2019.07.007

Advanced Sustainable Systems: "Carbon Nano□Onions Made Directly from CO2 by Molten Electrolysis for Greenhouse Gas Mitigation" by Liu, Ren, Licht, Wang and Licht, available at: https://doi.org/10.1002/adsu.201900056



Massive elimination of the greenhouse gas carbon dioxide through CNT-cement and CNT-aluminum. (credit, S. Licht, C2CNT)



C2CNT process is a new, high yield chemistry that splits the greenhouse gas CO2 into carbon nanotubes and oxygen, and photograph at C2CNT's Carbon Xprize Plant for the direct conversion of CO2 directly from the flue gas of the Shepard. (credit, S. Licht, C2CNT)

Materials Today Energy: "Carbon nanotube wools made directly from CO2 by molten electrolysis: Value driven pathways to carbon dioxide greenhouse gas mitigation" by Johnson, Ren, Lefler, Licht, Vicini, Liu and Licht, available at: http://dx.doi.org/10.1016/j.mtener.2017.07.003

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