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New Carbon Capture, Converted in Electricity (CCCE) technology by (UCnF) Reinforced Shape Memory Polymers-(SMPs) Nanostrip Multilayers

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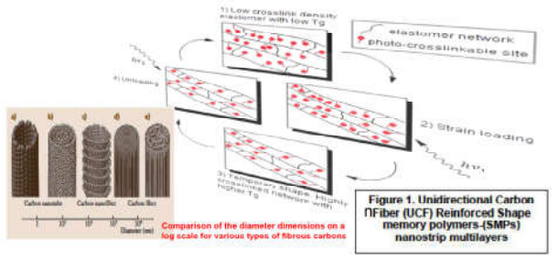
ABSTRACT

New Carbon Capture Converted in Electricity (CCCE) technology is essential to reduce global CO2 emissions. Large-scale adoption of classical CCUS technologies (for example, absorption, adsorption, and membrane separation) is currently limited by the additional energy requirements associated with CO2 capture, resulting in higher cost of energy and difficulties in transporting and sequestering the captured .
Recently, CO2 capture has been demonstrated for mobile sources, capitalizing on the waste energy of combustion engines. Conversion of CO2 to useful chemicals and fuels is understood to be a requirement for the commercial success of any CCUS process but has proven to be very difficult because of the thermodynamic and kinetic stability of CO2.
Our recently CO2 capture tech., has been demonstrated for mobile sources capitalizing on the waste energy of combustion engines.
New *Vyborcntmat-SMP (VycnT)* is a nanostrip multilayer's pseudo-composite (SMP), with better conversion of CO2 to oxalates. The pseudo-composite / CO2 electrochemical cell has been proposed as a novel approach to capturing CO2 from mixed CO2 / O2 gas streams, particularly using *Vyborcntmat-SMP (VycnT)*.This nanostrip multilayer's anodes of high-energy densities, demonstrated generate electrical energy for the cars.
These pseudo-composite / O2-CO2 electrochemical capture systems may be operated in either secondary (rechargeable) or primary (non-rechargeable) configurations.
Results showed in a secondary cell, reduced CO2 species react with oxidized metal ions to form the metal carbonate or bicarbonate and electricity during cell discharge. Recharging the cell would ideally reverse the reaction, consuming electrical energy to release the captured CO2 and O2 and regenerate the metal anode. Adoption of these secondary electrochemical systems in a new CCCE process would therefore facilitate separation and concentration of CO2, as demonstrated. electrical energy to release the captured CO2 and O2 and regenerate the metal anode. Adoption of these secondary electrochemical systems in a new CCCE process would therefore facilitate separation and concentration of CO2, as demonstrated.

Experimental Results :

Unidirectional Carbon nFiber (UCnF) Reinforced Shape memory polymers-(SMPs) nanostrip multilayers, show a new challange effect vs. shape memory alloys (SMAs).Carbon nanofibers are sp2-based linear, noncontinuous filaments . Its can be deformed into a new shape and recover to a programmed permanent shape by heating The SMPs effect of polymers can be established in different classes of polymers like: polyethylene, polyurethanes[and biodegradable. SMPs based on polycaprolactone. In the present work we show SMPs nanostrip multilayers experiments and results on the nanostrip multilayers sample of the Vyborcntmat-SMP (VycnT) which is compared with NiTi-shape memory alloys,and special stress measurements by diffraction system D8 DISCOVER -GADDS .



Comparison of the diameter dimensions on a log scale for various types of fibrous carbons

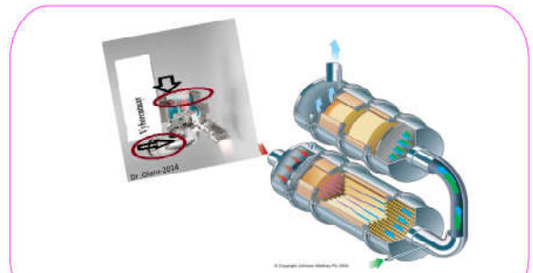
Figure 1. Unidirectional Carbon nFiber (UCF) Reinforced Shape memory polymers-(SMPs) nanostrip multilayers

Actual assemble turbocharger connect to diesel particulate filter. This captures some of black carbon particulate matter, which comes directly from the engine. These have been shown to work wrong for dealing with primary particulate matter and has dangerous effect on gaseous emissions.
New TURBO & Catalytic convertors by Shape Memory Polymers-(SMPs) nanostrip multilayers(VycnT) are used to reduce gaseous emissions and have been shown to work well with a range of pollutants, but less well with nitrogen oxides. More needs to be done to improve the ability of catalytic convertors and turbocharger-VycnT to clean emissions of nitrogen oxides.

WRONG FUNCTION-turbocharger connect to diesel particulate filter

Modeling Catalyst in MATLAB

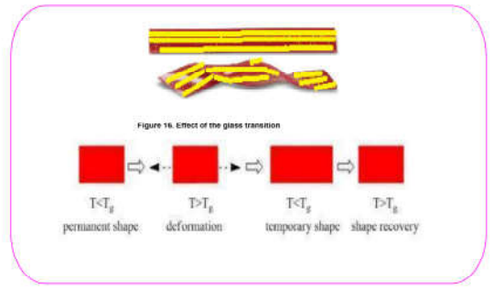
To satisfy emissions regulations, a complete aftertreatment TURBOCHARGER covered by VycnT system for a diesel engine must remove carbon monoxide(CO), unreacted hydrocarbons, nitrogen oxides (NOX), and particulate matter. As a result, a complete Johnson Matthey aftertreatment system comprises a diesel oxidation catalyst (DOC), a diesel particulate filter (DPF), an ammonia selective catalytic reduction (NH3) SCR catalyst, and an ammonia slip catalyst (ASC). The Unidirectional Carbon nFiber (UCnF) Reinforced Shape Memory Polymers-(SMPs) nanostripmultilayers - *Vyborcntmat - SMP (VycnT)* covering light materials of turbocharger, permit by thermo-mechanical actions some electrostatic effects and catalizator remove more pollutants.



TURBOCHARGER with UCnF & VycnT adapted to existed catalytic convertor system.

Our team has developed, new pseudo-composite material called *Vyborcntmat-SMP(VycnT)* -, a glare material for the manufacture of chromium-plated plastic components, which is extremely heat-resistant and at the same time galvanizable. This new material is Unidirectional Carbon nFiber (UCnF) Reinforced Shape memory polymers-(SMPs) nanostrip multilayers-Its softening temperature according to (ISO 306). The range working tested is about 55°C to 352 ° C, than with standard polycarbonate and ABS standard blends;

UNIDIRECTIONAL CARBON NFIBER (UCNF) REINFORCED SHAPE MEMORY POLYMERS-(SMPS) NANOSTRIP MULTILAYERS-*Vyborcntmat-SMP (VycnT)* : THE NANOSTRIP DIMENSIONS: 5 X 25 X 125 NM; PRESENTATION OF THE *Vyborcntmat-SMP (VycnT)* ,AFTER 25 TESTS , MAX. STRAIN 100%;



FINAL CONCLUSIONS

1. OUR TEAM HAS DEVELOPED, NEW PSEUDO-COMPOSITE MATERIAL CALLED *Vyborcntmat-SMP (VycnT)* -, A GLARE MATERIAL FOR THE MANUFACTURE OF CHROMIUM-PLATED PLASTIC COMPONENTS , WHICH IS EXTREMELY HEAT-RESISTANT AND AT THE SAME TIME GALVANIZABLE.

2. THIS NEW MATERIAL IS UNIDIRECTIONAL CARBON NFIBER (UCNF) REINFORCED SHAPE MEMORY POLYMERS-*(VycnT)* NANOSTRIP MULTILAYERS-ITS SOFTENING TEMPERATURE ACCORDING TO (ISO 306).

3. THE RANGE WORKING TESTED IS ABOUT 55°C TO 352°C, THAN WITH STANDARD POLYCARBONATE AND ABS STANDARD BLENDS.