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Recapture of Energy and Metals from MSW and ASR

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ABSTRACT

CarbonTech, LLC is the business vehicle to commercialize the licensed CATO Research Corporation process (US Patent No. 7,425,315) to generate an energy rich source of carbon from wastes such as municipal solid waste (MSW) and automobile shredder residue (ASR). With a focus on renewable energy technology, CarbonTech is in a unique position to reduce waste to landfills by 90%, generate a coal equivalent source of sustainable fuel to help reduce our dependence on fossil fuels, and recover metals for scrap recycling purposes.

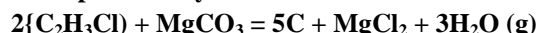
INTRODUCTION

The Colorado School of Mines verified the CATO process in an eighteen-month demonstration of the technology where they processed an assortment of ASR and MSW components at a 50-200 gram scale. Harmful gases such as furans and dioxins were not detected in their testing. The low temperature process preserves metals, such as aluminum foil, allowing them to pass through the process unaltered. The carbon generated from the process has potential BTU content equivalent to coal and can be utilized as a coal substitute, while steam generated during the process can be used to drive turbines that generate electricity. Following the CSM tests, Hazen Research performed confirming tests at ten (10) pounds scale and achieved comparable results to those at CSM.

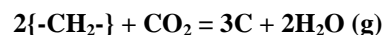
The unique aspect of the process is that the inert gases CO₂ and CO are utilized as oxidizing agents to achieve energy

conversion in a self-sustaining exothermic reaction due to the significant amounts of plastics and rubber in the raw feed material. At commercial scale of twenty-five (25) tons reacting per hour the CATO process will generate more than 58 MM BTU. It is important to realize that this is not an incineration process, but rather a chemical process. The key reactions include:

Chloride Capture /Vinyl Chloride i.e.:



Hydrocarbon Oxidation:



The carbon produced will be collected by screening and eddy current separation equipment which will remove the metals and other solids. A combined-cycle gas/steam turbine envisioned for power production from this process can achieve 1.2 Mw/ton versus mass burn-incineration that achieves 560 kW/ton. This suggests that our process can be twice as efficient as traditional waste to energy plants. We assume steam to electricity at 30% efficiency and carbon, an intense heat source, at 35%.

Existing waste to energy (WTE) incineration methods oxidize much of the recoverable metals in the MSW/ASR. The CATO process preserves these recyclable resources resulting in a greater economic yield per ton of MSW/ASR processed; the scrap metal recovered can be sold as secondary materials for reclamation or as primary metals, i.e. aluminum, copper, etc. Markets at the end of 2008