Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Thermite Reaction to Produce Artificial Reefs ALEXANDRO TREVINO, KAREN MARTIROSYAN, RICHARD KLINE, University of Texas, Rio Grand Valley — The degradation of coral reefs is an ecological issue that has prompted new collaboration by different scientific communities that would assist in the regeneration of the reefs. Unfortunately, these processes can be inefficient and extremely expensive prompting a new scientific approach by using solid-state combustion synthesis to regenerate the reefs. In this report we aimed to consolidate a multi-composite material to produce artificial reefs by initiating thermite reaction based on aluminum and polytetrafluoroethylene (PTFE) with natural reefs. By Thermodynamic analysis and experimentation it was established that a range between .03-.07 number of moles of PTFE was sufficient to reach an adiabatic temperature of over 1900 K, a sustained reaction and a physically stable product was achieved. Reefs are primarily composed of carbonates but their exact chemical composition can vary. X-ray diffraction analysis was used to determine the chemical composition of the reef and revealed presence of oxides, carbonates, silicates. The dominant chemical compounds that were identified are, SiO2 -17%, MgSiO3-14.5%, CaCO3- 11.4%, Ca(Si3O4). Using our thermite reaction we aimed to achieve optimal physical, chemical, and biological properties and maintain cost efficiency of the multi-composite material.

Alexandro Trevino
Univ of Texas, Pan American

Date submitted: 06 Nov 2015 Electronic form version 1.4