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Energy and Power Production **Fuels**

Carbon Slurry Fuels for Volume Limited Missiles

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Abstract: The Air Force has contracted with ER&E to develop a carbon slurry fuel with a minimum of 180,000 BTU/gal. This report provides results of the first year's effort of this twenty-seven month program. Initial results indicate that a **dispersion** of carbon black in JP-10 with select dispersing agents can be made that meets the BTU requirements. Preliminary results look promising. Combustion tests using a specially developed Liquid Fuel **Jet** Stirred Combustor (LFJSC) have demonstrated that carbon burnout efficiencies greater than 90% are achievable with 300 nm particles in residence times down to 4 ms. Homogeneous iron, lead, manganese, and zirconium catalysts at concentrations up to 1000 ppm proved ineffective as accelerators of carbon burnout. Further tests are in progress to optimize the composition of the most promising formulations and to test these materials under more vigorous conditions in order to determine their suitability for missile applications.

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