Hypergolic Liquid or Gel Fuel Mixtures

INTRODUCTION
Hypergolic liquid or gel fuel mixtures utilized in bipropellant propulsion systems are disclosed as replacements for fuels containing toxic monomethylhydrazine. The fuel mixtures include one or more amine azides mixed with one or more tertiary diamine, tri-amine or tetra-amine compounds. The fuel mixtures include N,N,N',N'-tetramethylethylenediamine (TMEDA) mixed with 2-N, N-dimethylaminoethylazide (DMAZ), TMEDA mixed with tris(2-azidoethyl)amine (TAEA), and TMEDA mixed with one or more cyclic amine azides. Each hypergolic fuel mixture provides a reduced ignition delay for combining with an oxidant in fuel propellant systems.

CONCEPT
The fuel mixtures have advantages in reduced ignition delay times compared to ignition delay times for each unmixed component, providing a synergistic effect which was not predictable from review of each component’s composition. Additional fuel mixtures include various tertiary diamine, tertiary tri-amine or tetra-amine compounds combined with one or more amine azides or imidic amide compounds, to provide clean burning, high performing, and non-toxic fuels.

INVENTION OVERVIEW
The technology is a hypergolic liquid or gel fuel mixture utilized in bipropellant propulsion systems fuel mixture reducing ignition delay times compared to ignition delay times for each unmixed component.

- Improved more efficient and safer fuel mixtures.
- U.S. Patent Number: 8,435,364 B2
- Application Number: 13,189,874
- Date of Patent: 7 May 2013

POTENTIAL MARKET
- Fuel Mixture Industry

DOING BUSINESS WITH AMRDEC
AMRDEC is a leader in partnering with domestic firms. Successfully developed and implemented innovative tools to ease the technology transfer process such as:
- Patent License Agreements
- Cooperative Research and Development Agreements
- Test Services Agreements

CONTACT INFORMATION
If you would like more information about this technology or about AMRDEC’s technology program, contact:

U.S. Army Aviation and Missile Research, Development, and Engineering Center
ATTN: RDMR-CST
Office of Research and Technology Applications
5400 Fowler Road
Redstone Arsenal, AL 35898

Phone: 256-876-8743 or 256-313-0895
E-mail: ORTA@amrdec.army.mil