



NAVAL RESEARCH LABORATORY

TECHNOLOGY LICENSING OPPORTUNITY

ZIRCONIUM-ALUMINUM-HYDRIDE NANOPARTICLES

Advantages/Features

Provides air and moisture resistant reactive metal nano-particles

Processing provides >90% of active metal by mass

Nano-particles have high surface area ($260 \text{ m}^2/\text{g}$) and accelerate burn kinetics

Applications

Energetic Additives

Solid Metal Fuel

Propellants

For more information contact:

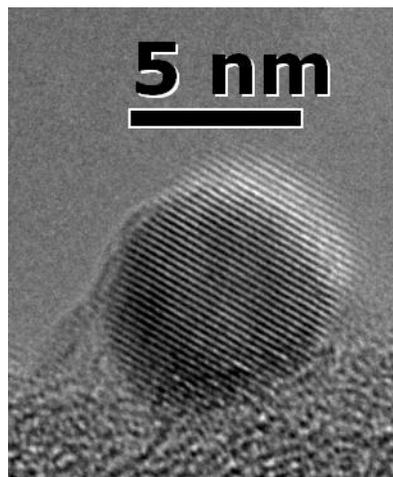
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The Naval Research Laboratory (NRL) has eliminated the formation of aluminum oxide coating, the impediment associated with burn kinetics for metal-Al Hydride nano-scale particles. NRL Investigators have developed a method for producing stabilized Zr-Al Hydride nano-scale particles with carbohydrate based gel coatings that are air stable. Synthesis of surface passivated Zr-Al mixed metal-hydride nanoparticles was accomplished via a multi-step process under inert atmosphere conditions, which involved a sonochemically-mediated decomposition of a pre-synthesized zirconium-aluminum-hydride precursor. The particles were surface passivated using carbohydrates and were shown to be stable in air and partially stable in water. Some of the possible applications for this nanopowder material are as an energetic additive or a metallization agent for energetic mixtures, solid fuel, and other applications.

References

"Surface Passivated Air and Moisture Stable Mixed Zirconium Aluminum Metal-Hydride Nanoparticles" Mater. Res. Soc. Symp. Proc. Vol. 1056 (2008) 1056-HH03-16.

Available for License: Patent applications have been filed.



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