NEXT GENERATION MICRO-ENCAPSULED SUPERIOR ROCKET FUEL

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Abstract: Today's rocket fuel is outdated, is heavy to transport, is extremely expensive to manufacture and use in chemical and/or oxygen derivatives and is not good for the earth's environment and/or ecology. Therefore, it is time to develop the next generation rocket fuel that is at least 50-100 times more powerful than today's available rocket fuel, and is much more efficient and proficient to use and is safe for the earth's environment and ecology as well. The project focus was to develop next-generation solid-sphere prillings that have secondary and tertiary matrixes comprised of microcrystalline hydrocarbon nano particles for use as an advanced hybrid rocket fuel based on liquid layer hybrid combustion theory.

Key words: Propulsion, Fuel, Space, Rocket.

1 Introduction and Background

We produced prillings in sizes ranging from 0.25 μm to 8,000 μm using synthetic PCM's that are highly stable. The end result is demonstration in a video presented at the end of this paper that shows that when only 2 grams of microencapsulated prillings is formulated with a prillings with crude, bench rocket motor test that this test demonstrates how this rocket formula fuel is at least 50-100 times more powerful, efficient, proficient, and economical to produce and manufacture than today's conventionally used rocket fuel.

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1.1 Basic Testing and Microencapsulation Processes

Our microencapsulation process [1] and instrument is a NASA Spinoff technology first used to produce glass microbeads in space on STS-41 and STS-43 and later to spawn creation of an arsenal of oilspill cleanup, medical, pharmaceutic and food products.

The project focus was to develop next-generation solid-sphere prillings that have secondary and tertiary matrixes comprised of microcrystalline hydrocarbon nano particles for use as an advanced hybrid rocket fuel based on liquid layer hybrid combustion theory. We produced prillings in sizes ranging from 0.25 μm to 8,000 μm using synthetic PCM's that are highly stable.

1.2 Spin-off NASA Technology and Applicable To Other Products

The video demo [2] shows small scale static test (burn) using just 2 grams of prilling product that is 250 μm in size and encapsulated in a polypropylene sheath comprising the solid rocket fuel component. The oxidizer is O_2 (gas). This technology is representative of next-generation 'future fuels' that produce a very thin, low viscosity, low surface tension liquid layer on the fuel surface when it burns. Driven by the oxidizer, lift off and entrainment of PCM, droplets and secondary nanoparticle hydrocarbon components greatly increase the overall fuel mass transfer rate simulating a continuous spray injection system with the fuel-components vaporization occurring around the droplets convecting between the melt layer and flame-front resulting in higher regression rates and exponential increase in thrust.

2 Conclusion

Is simple that this paper provides a new breakthrough in the production of a superior next generation rock fuel. Which will also compliment the next generation in space exploration in our solar system as well.

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2.2 Financing

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References

[1] RMANNCO Laboratories. **Microencapsulation prilling process to produce rocket fuel**. Reno: RMANNCO, 2013.

[2] _____. **Short run showing test with 2 grams of RMANNCO's prillings with crude, bench rocket motor**. Available at: www.youtube.com/watch?feature=player_embedded&v=GfFkXxXYYaY. Accessed in: Jun. 7^{th}, 2013.