IV. CONCLUSION

From the systematic simulations carried out and thorough data analysis, several noticeable conclusions can be drawn:

1. Hydrogen based composition(s) were expected to have similar results as liquid hydrogen. This assumption was proved incorrect.
2. Simulation carried out with a semi-cryogenic catalyst viz., liquid hydrogen with the base propellant which results in an average higher Isp compared to when added to the oxidizer.
3. Hydrocarbons principally do not affect the specific impulse. But, in selected cases there were several alterations. Hydrocarbons showed a greater and steeper fall in Isp when added to oxidizer than the fuel.
4. Hydrides gave a higher rise in Specific Impulse than Hydrocarbons. They resulted in higher rise in Isp when added to oxidizer as compared to their addition in fuel. Hydrides tend to act better as thrust activators whereas hydrocarbons can be classified as thrust terminators.
5. Beryllium hydride in oxidizer had an attractive series of results. The composition, $MMH/BeH_2/N_2O_4$ = 30/14/56, gives an Isp of 431.65 sec. This is an appealing alternative to the cryogenic propellant in upper stage rocket propulsion engine and advanced high-performance missiles. This composition has high Isp and can be made in standard conditions resulting in sufficient reduction of the expenditure focusing production and storage.
6. Methane, RP-1 and Butadiene had proved to be useful during the need for thrust termination due to their instant drops in Specific Impulse.
7. *Potential applications of the present study:* Results from the above compositions can be used in missile systems, re-entry vehicles, launch systems, space shuttles, power generation and many more. The work conveys wide scope of utilizations including simple dealing with, stability, cost viability and could be broadly utilized in Surface to Surface, Surface to Air, Anti-Tank, Multi Target, IRBM (Intermediate Range Ballistic Missile), Guided and Supersonic rockets under shifting conditions.

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