Brief write-up on HEMCENE Technology

4-Dimethylsilyl Butyl Ferrocene Grafted Hydroxy Terminated Polybutadiene (HEMCENE) is a potential burn rate catalyst proven to be used for special purpose high burning rate rocket propellants. HEMCENE is advantageous in many respects over the conventional solid and liquid burn rate catalysts.Apart from significant catalytic effect to enhance burn rate of solid rocket propellants, HEMCENE eliminates issues related to processing and migration during storage. Further, structural similarity with HTPB binder makes it compatible with other ingredients used in composite propellant.

To address the sustained requirement of HEMCENE for various projects of DRDO, HEMRL has developed a bench scale process technology. The present method for preparation of HEMCENE is a three step process that includes total five reactions namely Acylation, Reduction, Grignard, Silylation and Grafting. All the three steps are optimized for mole ratio, temperature, time and product isolation. The final product HEMCENE is obtained as a dark red thick liquid polymeric material.At present, the process for HEMCENE is realized at 1-2 kg/batch levelwithyield of ~75%. The properties of HEMCENE developed in this process meets desired specification w.r.t %Fe, Molecular weight, Viscosity etc. required for end applications.

In order to meet the futuristic bulk requirementto the tune of few tons per annum for various DRDO programs, it is planned to transfer the technology to suitable industry partners for production of HEMCENE. In view of this, Expression of Interest is invited from interested industrial partners for ‘Transfer of Technology’ of HEMCENE.