

1.0 Overview

There is continuing concern about the depletion of the ozone layer. Recently it has been determined that effluents from rockets exhausts contain chemical species that can be classified as Potentially Ozone Reactive Chemicals (PORCs). Calculations on the destruction of ozone layer suggest that that rockets contribute about ~1% to the overall depletion on a yearly basis. This has motivated studies to determine methods and processes which can reduce the amount of ozone depletion.

This study examines the use of alternate propellants to reduce the production of PORCs. The methodology is straightforward. The composition of a current solid rocket is examined and those chemical species which are classified as PORCs are identified. Alternate propellants are identified which reduce or eliminate the production of those PORCs. Not surprisingly, some of the exhaust species produced by the alternate propellants are classified as PORCs. The amounts of the species are quantified and found to be acceptably small. The technology status of these propellants and the rocket engines that would utilize them is briefly summarized. The safety, handling and toxicity characteristics of alternate propellants are presented.