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THE INFLUENCE OF NITROGEN PRESSURIZATION OF LIQUID OXYGEN QUALITY

Abstract

The influence of nitrogen pressurization on liquid oxygen quality determines the launch vehicle filling mode. It is very important for the liquid oxygen filling system design. In order to insure liquid oxygen quality during launch vehicle power system test filling process, based on the whole propellant filling process, static pressurization and dynamic pressurization tests were adopted to simulate each filling phase, including chill down, low flow rate, high flow rate, parking and sub-cooled add filling. And the according liquid oxygen purity tests and numerical simulations were carried out. Results show that the liquid oxygen purity is always higher than 0.995. And the nitrogen pressurization satisfies the demand of liquid oxygen quality. Actually, only liquid oxygen purity test was adopted without composite analysis on detail. The real nitrogen solubility and its variety characteristics during the tests were not revealed, so this method needs to be improved further.