

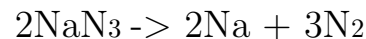
MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Interactive Presentations (IP)

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SPACECRAFT EJECTION MECHANISM USING SODIUM AZIDE

Abstract

Sodium azide has been well known for its long term usage in air bags in cars and other road vehicles. The idea is to use the same principle used in air bags and create an impulse to eject the spacecraft. Sodium azide when heated undergoes the following reaction and produces Nitrogen gas:



Now a little sodium azide could produce a sufficient volume of nitrogen gas. The idea is to use a piston-cylinder arrangement to supply the impulse and eject the spacecraft from the locking mechanism. When nitrogen gas is produced, its expansion would apply pressure on the piston. Since the reaction is sufficiently fast, the fast moving piston would then generate an impulse which would in turn generate the required impulse for the ejection of the spacecraft. The impulse can be easily calculated by the force exerted by the gas on the piston which can in turn be calculated by the pressure obtained from the ideal gas equation. Then multiple mini piston-cylinder arrangements can be assembled onto the spacecraft ejection mechanism and the sufficient impulse can be generated.