Viability of bacterial spores exposed to hydrazine

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For the purposes of planetary protection, a series of experiments were performed to answer a long-standing question about the potential of bacterial contamination of interplanetary spacecraft from liquid hydrazine. Spores of *Bacillus atrophaeus (*ATCC No. 9372, also known as *Bacillus subtilis* var. niger, and BSN) were exposed to hydrazine for various durations. Then the survivors were enumerated using the NASA standard planetary protection pour plate assay. It is important to note that in these experiments, the hydrazine was removed prior to the assay. This eliminated the possibility that the presence of hydrazine, rather than a prior exposure, was inhibiting germination and or reproduction. Populations of 10^6 spores were eliminated within 30 minutes. These results indicate that bulk hydrazine rocket propellant may be considered free of living bacterial cells for planetary protection compliance.