

Abstract Submitted
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Nanostructured Oxygen Generators for Aerospace Life Supporting System¹ KAREN MARTIROSYAN, University of Texas at Brownsville — The solid fuel oxygen generators (SFOG) used as backup oxygen delivery systems for International Space Station (ISS). Well established SFOG formulations include sodium/lithium chlorite and metal micro-particles. However, common SFOG are accompanied by formation of high temperature spots, which decrease the efficiency and safety performance. In this report we present multicomponent nanostructured oxygen generators (NOGs) based on $\text{NaClO}_3\text{-Sn-Co}_3\text{O}_4$ system that allow reduction of the overall reaction temperature and elimination of the hot temperature fluctuations. The nano size reactant increases the surface contact area between the solid reagents and homogeneity of mixture as well as improves the uniformity of reaction thermal front. We describe here a novel one-step (metal nitrate–glycine) solution combustion synthesis of nanostructured highly crystalline cobalt oxide nanoparticles. Furthermore, we determined the influence of the nitrate/glycine ratio on the crystallinity and particle grain size of the Co_3O_4 . The factors affecting to ignition and performance characteristics of SFOG have shown that many physical and chemical properties of the individual reactants, as well as preparation methods may significant affect on the overall behavior of the oxygen generation rate. The specific application of SFOG requires that the ignition and performance characteristics be tailored to have precise sensitivities and oxygen outputs.

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