

Magnesium oxide (MgO) is a compound that is safe to use as a food additive. Recently, it is reported that MgO possesses antimicrobial activity probably due to its rich surface reactivity. In this study, we propose a novel process to synthesize MgO materials with increased surface area and anion concentration of MgO. These amorphous MgO materials will be tested for their antimicrobial activity in relationship to their surface properties. The mechanisms of microbial killing and the applications of MgO will be explored. The broader impacts of this project include the potential development of materials for antimicrobial applications in water treatment, food safety, sterile processes, bioterrorism, and the space program. In this study, the application of MgO materials in the space program will be explored through the partnership with the NASA Jet Propulsion Laboratory and the student internship.