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Sporicidal Effects of Iodine-oxide Thermite Reaction Products
ROD RUSSELL, STEPHAN BLESS, Institute for Advanced Technology, ALEXANDRA BLINKOVA, Dept of Molecular Genetics and Microbiology - UT Austin, TIFFANY CHEN, Dept of Chemistry and Biochemistry - UT Austin, INSTITUTE FOR ADVANCED TEHNOLOGY COLLABORATION, DEPT OF MOLECULAR GENETICS AND MICROBIOLOGY - UT AUSTIN COLLABORATION, CHEMISTRY AND BIOCHEMISTRY - UT AUSTIN COLLABORATION — Iodine pentoxide-aluminum thermite reactions have been driven by impacts at 1000 m/s on steel plates 3 mm or thicker. The activation energy of this material reaction is 197 J/g. The reactivity is increased by reducing grain size. This reaction releases iodine gas that is known to be a sporicide. In order to test the impact reactions for sporicidal effects, reactions took place in closed chambers containing dried *Bacillus subtilis* spores. The reduction in colony-forming units was dependent on the exposure time; long exposure times resulted in a 10^5 decrease in germination rate. This was shown to be due to the gas exposure and not the heat or turbulence. Sporicidal effectiveness was increased by adding neodymium and saran resin. The sporicidal effect is very dependent on exposure time, ranging from about 90% kill for times on the order of a second to 99.99% for one-hour times.

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