



FOR IMMEDIATE PRESS RELEASE

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ARCTECH Announces Success in Actodemil® Technology for Safe Destruction of Bulk Ammonium Perchlorate

Ammonium perchlorate (AP) is a primary propellant component of missiles and tactical rockets. The propellant component contains mixtures of AP and aluminum with a polymer binder (composite propellants) or AP and other organic energetic propellant ingredients such as NG or NC (composite modified propellant). AP is an oxidizer in the propellant components. A large number of missiles have reached end of the acceptable shelf life and are now obsolete. Also as per International Treaties, the U.S. is seeking to safely recycle or destroy them.

AP is now recognized as extremely hazardous because of its endocrine disruption behavior. It is highly soluble in water and has resulted in contaminating large aquifers in the U.S. and other countries. AP is recalcitrant to natural biodegradation as well as chemical destruction. (However, adapted microbes are being utilized for biodegradation of ppm levels of AP contaminated wastewaters. Because of high chlorine content, thermal incineration results in release of toxic dioxins in the environment. Perchlorate has a paradoxical behavior. It can be reduced by common reducing agents thermodynamically, however kinetically it is extremely inert to most of reducing agents due to the presence of high energy barrier. Currently, there is no environmentally safe solution for bulk AP destruction.

The Actodemil® technology (U.S. Patent No. 5,538,530) for safe destruction of AP is a process based on using catalyzed proprietary organic humic acid (HA) for safe destruction of explosives and energetic materials. For bulk AP destruction, this technology utilizes the reducing properties of HA to convert perchlorate to non-hazardous chloride ion.

Laboratory feasibility tests were conducted using the Actodemil® technology. The destruction of bulk perchlorate (10% of AP) using the Actodemil® technology ranged from 94.7 ~ 99.9 %. It was also confirmed that all the perchlorate was converted to non-toxic chloride in the final product, indicating that no harmful intermediate such as chlorate (ClO₃) or chlorite (ClO₂) were generated. Further more, there no perchlorate precipitation was observed on the solid phase.

These tests demonstrate that the Actodemil® technology is effective in destruction of AP without producing any byproducts. Furthermore, this proposed process is a closed treatment technology with no discharge of AP residues to the environment. The costs of chemicals and supplies is estimated to be \$120 ~ \$180 per Multiple Launch Rocket System (MLRS) missile assuming that 1 ton of bulk AP is produced from 10-15 MLRS missiles. The implementation of this technology will provide a cost effective and environmentally sound approach for demilitarization of obsolete missiles containing AP.

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