

The Agency of Industrial Science and Technology (AIST) of Japan has developed and patented a suite of perfluoroalkanoyl compounds useful as intermediates in an abundance of fluorinated polymer compositions.

APPLICATIONS OF THE OPPORTUNITY

By oxidizing nitrogen-containing perfluorocarboxylic acid fluoride raw materials to form internal peroxide bonds, the resulting compounds can be utilized in the same applications as conventional perfluoroalkanoyl peroxides.

These compounds are useful as:

- Intermediates in surfactants, pharmaceuticals, agricultural pesticides, x-ray contrast agents, and flame retardants.
- Polymerization initiators for fluorine-containing monomers;
- Reagents for introducing nitrogen-containing perfluoroalkyl groups;
- Perfluoro-tertiary diamines in heat transfer media or solvents;

Through proper modification of the substituents, an environmentally friendly alternative to Halon can be produced. This specific example of the utility of this opportunity is protected by one of the patents in this offering; namely US 5,609,787.

BACKGROUND

The trifluoromethyl group (CF₃) is an important structural moiety in diverse classes of bioactive organic molecules. The CF₃ group has a larger van der Waals radius than that of a CH₃ group and the same electronegativity as oxygen

Trifluoromethylated polymers have high thermal stability and enhanced mechanical and electrical properties. Many of these polyfluorinated polymers find application as liquid crystals.

Many compounds that contain these perfluoroalkoyl groups are known to exhibit lubricity, surface activity, and physiological activity.

INTELLECTUAL CAPITAL

On April 1, 2001, Japan's National Institute of Advanced Industrial Science and Technology began operations as the "new" AIST.

The new AIST is a research organization that comprises 15 research institutes previously under the former Agency of Industrial Science and Technology in the Ministry of International Trade and Industry and the Weights and Measures Training Institute.



AIST is Japan's largest public research organization with research facilities and more than 3,200 employees across Japan.

PATENTED TECHNOLOGY

Current U.S. patents granted that protect the technology include:

5,609,787	This inter-related suite of eight patents provides broad protection across a range of applications. They include composition of matter and methods claims. A detailed table that describes the patents in detail is included with this summary.
5,486,275	
5,476,934	
5,380,844	
5,347,002	
5,256,825	
5,208,339	
5,117,055	

FOR MORE INFORMATION

AIST is seeking to license these technologies and provide assistance with their commercialization success to qualified organizations.

Consideration will be provided to a range of financial, strategic, and commercial investment options.

Certain circumstances will warrant consideration for nominal funding from AIST.

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#	Patent	Features
1.	5,609,787	Title: Method for Extinguishing Fire. <ul style="list-style-type: none"> One claim protecting a polyfluorotertiary amine: $(CF_3)_2NR_f$, where R_f is a polyfluoroalkenyl group of 2-4 carbons. Provides biologically- and environmentally-safe alternative to Halon. Not harmful to the ozone.
2.	5,486,275	Title: Nitrogen-Containing Perfluoroalkyl Bromide and Method of Production Thereof. <ul style="list-style-type: none"> Decarbonylation of perfluorocarboxylic acid bromide with ultraviolet light.
3.	5,476,934	Title: Nitrogen-Containing Perfluoroalkanoyl Peroxide and Method for Production Thereof. <ul style="list-style-type: none"> Broader "method claims version" of AIST-5,256,825, and other related AIST patents. Related to AIST-5,380,844, AIST-5,347,002, AIST-5,256,825, and AIST-5,208,339 (Application 941,884, Filed 9/8/1992).
4.	5,380,844	Title: Nitrogen-Containing Perfluoroalkanoyl Peroxide and Method for Production Thereof. <ul style="list-style-type: none"> Claims 1 and 3 are identical to AIST-5,208,339 and AIST-5,347,002 but with broader claim 2, involving R_f_2N group. Div. of 78,817 (Filed 6/21/1993), which is related to AIST-5,256,825 and AIST-5,208,339.
5.	5,347,002	Title: Nitrogen-Containing Perfluoroalkanoyl Peroxide and Method for Production Thereof. <ul style="list-style-type: none"> Claims 1 and 3 are identical to AIST-5,208,339 and AIST-5,380,844 but with broader claim 2, involving R_f_2N group. Related to AIST-5,256,825 and AIST-5,208,339.
6.	5,256,825	Title: Nitrogen-Containing Perfluoroalkanoyl Peroxide and Method for Production Thereof. <ul style="list-style-type: none"> Div. of 941,884 (Filed 9/8/1992), now US 5,208,339.
7.	5,208,339	Title: Nitrogen-Containing Perfluoroalkanoyl Peroxide and Method for Production Thereof. <ul style="list-style-type: none"> Claims 1 and 3 are identical to, AIST-5,476,934, AIST-5,380,844, and AIST-5,347,002 but with narrower scope of claim 2, involving R_f_2N group. Application 941,884 (Filed 9/8/1992).
8.	5,117,055	Title: Method for Direct Conversion of Fluorocarbonyl Group into Halogenides. <ul style="list-style-type: none"> Novel perfluoroalkyl iodides and bromides are produced by subjecting perfluorocarboxylic acid fluorides to a thermal reaction with LiI or $LiBr$. Economical production of intermediates for the synthesis of fluorine-containing products such as surfactants, agricultural pesticides, and medicines in high yields from readily available raw materials. Application 482,969 filed 2/22/1990.