Environmental Remediation of TATP, TNT and RDX Nitro Explosives Utilizing Bimetal Micro Catalysts

Advantages
- Faster degradation of nitro explosive compounds and TATP
- Final degradation products produced are more environmentally friendly than other current remediation methods
- Bimetal catalyst can be used directly at the site of contamination

Invention
The synthesis of micron sized bimetal catalyst and there uses thereof for safely degrading nitro explosive compounds at the site of contamination

Background
Grounds subject to heavy munitions, waste streams leading from industrial facilities and other various sites where nitro explosives, such as TNT and RDX, are utilized become subjected to hazardous levels of contamination from these compounds. TATP is a peroxide based explosive that can be made with easily accessible materials, because of this it is also found in the environment at hazardous levels. These toxic contaminants find their way into groundwater and soil in which they become a public health concern such that the EPA has increased legislation and regulations for the removal of these contaminants in the environment. Current bioremediation uses microbial techniques, which have the drawback of being slow and typically only working on lower levels of contamination.

More recent research utilizes metallic catalysts to degrade these contaminations. Unfortunately these reagents only work under specific environmental conditions and often degrade the explosives into TAT, which is considered far more hazardous than the parent TNT contamination. Additionally, utilizing these methods TATP degradation must be done in a lab setting which requires disturbing the contamination zone and then handling this highly dangerous and unstable compound. Research scientists at UCF have created a bimetal catalyst that degrades these explosives at quicker rates, while producing less toxic degradation products. Bimetals combined with other technologies such as emulsified zero valent metal (EZVM) provides an in situ (on site) method for TNT, RDX and TATP remediation in the environment.

Application
The invention can be utilized for the direct cleanup and degradation of explosives found in soil, groundwater and structures.

Lead Inventor
C. A. Clausen III, Ph.D.

Selected References

Contact: Andrea Adkins; University of Central Florida; Office of Research and Commercialization, 12201 Research Parkway, Suite 202, Orlando, FL 32826-3246 Phone: (407) 823-0138; Fax: (407) 882-9010; aadkins@mail.ucf.edu; IP # 31605