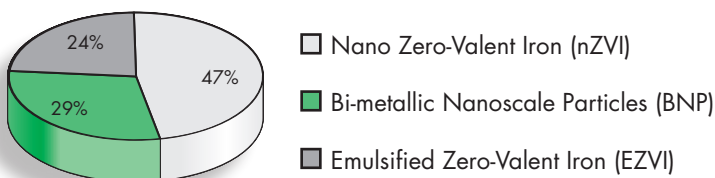


Nanotechnology Database Fact Sheet

Introduction

The U.S. Environmental Protection Agency (EPA) Office of Superfund Remediation and Technology Innovation (OSRTI), Technology Innovation and Field Services Division (TIFSD) is interested in providing federal and state project managers and others with timely information about developments in the field of hazardous waste clean-up. To achieve this goal, EPA has developed eight on-line remediation databases, which are available on the Hazardous Waste Clean-Up Information (CLU-IN) Web site (www.cluin.org). These on-line databases can also be used as a networking tool (each profile lists a contact) to identify past solutions and lessons learned that would apply to new sites with similar contaminants and climate. EPA has recently developed two new on-line databases to summarize timely information about the use of selected full-, field- and pilot-scale applications of nanotechnology and implementation of ecological revitalization. This fact sheet introduces the nanotechnology database.



Type of Nanomaterials and Percentage Use at Database Sites

Background Information

Nanotechnology is an emerging technology that is generally defined as the ability to create and use materials, devices and systems with unique properties with a size of approximately 1 to 100 nanometers (nm). Applications of nanotechnology in environmental

protection draw on the unique properties of these materials and include (1) sensors for improved monitoring and detection capabilities and (2) treatment and remediation techniques for cost-effective and rapid site cleanup. This database contains information about completed and on-going projects where nanotechnology was applied to aid in the cleanup process. Projects for this database are collected using information from technical journals and conference proceedings, as well as information obtained from technology vendors and site managers.

As of November 2009, the database included information on 17 nanotechnology projects, describing domestic and international sites and completed and on-going nanotechnology applications. The project profiles provide information on the site history, the types of contaminants treated, the nanomaterial vendor and the type of nanomaterial used. Performance results, cost, length of operation and monitoring requirements are also included. As shown in the pie chart (upper left), the primary types of nanomaterials applied at the 17 sites include nano zero-valent iron (nZVI), bi-metallic nanoscale particles (BNP), and emulsified zero-valent iron (EZVI). Profiles include nanotechnology applications for the remediation of contaminants such as trichloroethene (TCE), perchloroethene (PCE), 1,2-dichloroethane (DCA) and vinyl chloride in various media. The nanotechnology database can be found on the Hazardous Waste Clean-Up Information (CLU-IN) Web site at www.clu-in.org/products/nano/.

How Can I Share Information on Additional Projects and Sites?



EPA is continuing to examine trends in the use of nanotechnology. Areas of particular interest include measurement of performance and cost, use of nanotechnology in remedial systems, and the fate and transport of contaminants where nanomaterials are used. EPA encourages project managers, site owners, and technology vendors to share information to update existing profiles or add new profiles. To share information on new or existing sites, contact John Quander, EPA, by telephone at (703) 603-7198, or by e-mail at quander.john@epa.gov.



Office of Solid Waste and
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(5203P)

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EPA-542-F-10-002
February 2010
www.epa.gov
www.cluin.org



Nanotechnology Database



This fact sheet describes a new on-line Nanotechnology database that is available on the Hazardous Waste Clean-Up Information (CLU-IN) Web site (www.cluin.org) sponsored by the U.S. Environmental Protection Agency's (EPA) Office of Superfund Remediation and Technology Innovation (OSRTI), Technology Innovation and Field Services Division (TIFSD). For additional information on the Nanotechnology database, or any of the ten remediation databases featured on this web site, please visit the following web links:

- ◆ **Ecological Revitalization (NEW)**
www.clu-in.org/products/ecorev/
- ◆ **Nanotechnology (NEW)**
www.clu-in.org/products/nano/
- ◆ **Phytotechnology**
www.clu-in.org/products/phyto/
- ◆ **In Situ Chemical Oxidation**
www.clu-in.org/products/chemox/
- ◆ **Remediation Technology Demonstration**
www.clu-in.org/products/demos/
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- ◆ **In Situ Thermal Treatment**
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