



Recovery of Mercury



Developer: ADA Technologies, Inc.
Contract Number: DE-AC21-97MC32195
Crosscutting Area: ESP

Mixed Waste
FOCUS AREA

Problem:

Mercury was widely used in the Department of Energy's (DOE's) weapon-making facilities, primarily because of its radioactivity shielding properties and its ability to dissolve lithium in the separation of lithium-6 (Li^6) from lithium-7 (Li^7). This broad use of mercury has created a wide range of mercury-contaminated wastes and wastewaters.

As of May, 1995, there were over 400 identified mercury-containing liquid wastes each with a volume of more than 250 gallons in the DOE Mixed Waste Inventory and likely an equal or greater volume of DOE wastes that are not mixed with low-level radioactivity. In addition, a significant volume of mercury-contaminated secondary wastewater will be generated in future waste treatment activities and in decontamination and decommissioning (D&D) efforts.

Solution:

ADA Technologies, Inc. has developed a process whereby dissolved mercury is selectively removed from wastewater streams. The process is based on the sorption of mercury on specialty sorbents, regeneration of the sorbent by

thermal means, and recovery of the desorbed mercury in a recyclable form. ADA holds a patent on a similar process for removing mercury from off-gases (US 5,409,522, April 25, 1995) and has tested it under conditions typical of municipal waste incinerators. ADA has adopted the name "Mercur-RE" to describe its process.

Benefits:

- ▶ Sorbents are selective for mercury
- ▶ The sorbents can be thermally regenerated for reuse
- ▶ Liquid mercury can be recovered in its elemental form
- ▶ Minimal or no secondary wastes

are generated

- ▶ There are numerous commercial applications, including dental waste waters

Technology:

ADA's process is based on the sorption of mercury on specialty sorbents and the regeneration of the sorbent by thermal means, recovering the desorbed mercury as liquid elemental mercury. ADA's process removes dissolved mercury from liquid waste streams by selective sorption utilizing a noble metal sorbent. The process is based on selective sorption of dissolved mercury (in both elemental and ionic forms) by a noble metal, such as gold or silver. Mercury readily



