

Prudent Practices for Disposal of Chemicals from Laboratories

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A report issued by a National Research Council (NRC) committee (1, 2) provides comprehensive and practical guidelines for laboratories on the handling and disposing of waste.

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Summary. A recent report of the National Research Council contains guidelines and recommendations for handling and disposing of unneeded chemicals from laboratories. Suggestions are also made for simplifying various procedures imposed by the regulatory agencies with authority over the disposal of laboratory chemicals

Chemical waste and unneeded chemicals are unavoidable products of most kinds of laboratory work, including research, product development, teaching, analysis and testing, and quality control. Moreover, in multidisciplinary institutions, such materials are generated not only in chemistry laboratories but in others such as biology, geology, electrical engineering, art, physics, and health service laboratories as well. The NRC report defines a laboratory as,

a building or area of a building used by scientists or engineers, or by students or technicians under their supervision, for the following purposes: investigation of physical, chemical, or biological properties of substances; development of new or improved chemical processes, products, or applications; analysis, testing, or quality control; or instruction and practice in a natural science or in engineering. These operations are characterized by the use of a relatively large and variable number of chemicals on a scale in which the containers used for reactions, transfers, and other handling of chemicals are normally small enough to be easily and safely manipulated by one person (1, pp. 1-2)

The unneeded chemical material generated in laboratory operations must be disposed of in ways that are safe, envi-

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chemicals from laboratories, which according to Environmental Protection Agency (EPA) estimates, account for less than 1 percent of the total hazardous waste generated in the United States. Because very few laboratories have facilities for disposal of unneeded chemicals at their sites, the waste must be transported to a disposal site in conformance with numerous regulations of the EPA, the Department of Transportation (DOT), and the states. The unneeded chemical material from a laboratory operation differs from that of a typical industrial operation in (i) being of much smaller quantity, (ii) having much greater chemical diversity, and (iii) changing in chemical character from day to day. It often includes significant numbers of chemicals of unknown toxicity or in quantities too small for practical characterization, and such materials must be classified, transported, and disposed of as hazardous waste. The voluminous record keeping required by regulations for this multitude of small samples not only poses a substantial problem for many laboratories but is also of questionable practical value. This problem is exacerbated

by differences and overlap among various federal, state, and local regulations.

The NRC report urges EPA, DOT, and state and local governments to establish "a mutually consistent, interlocking regulatory approach" (1, p. 10). Seven categories of laboratory materials, reflecting chemical characteristics, are proposed: reactive, toxic, ignitable, corrosive (acid), corrosive (base), oxidizers, and miscellaneous laboratory samples. "Miscellaneous laboratory chemicals" would apply to materials that are routinely generated in laboratories—and rarely elsewhere—and the transportation and disposal of which are not addressed in current regulations. The class would be limited to small individual samples of such materials as residues from small-scale tests, minor by-products from reactions, residues from analytical procedures, used filter paper, and partially used small containers of reagents.

Record keeping could be simplified if containers of chemically compatible materials overpacked in a steel drum with inert filler (a lab pack) were allowed to be classified generically rather than listing each sample in a pack.

Although shippers can apply to DOT for an exemption to transport such containers and the containers need only have generic description of the contents (3), this exemption does not eliminate the EPA record-keeping requirements for individual samples. Transportation of laboratory waste must still meet requirements of both EPA and DOT, which are not the same in all respects. Furthermore, many states have regulations on transportation of hazardous waste that may overlap and differ from those of EPA and DOT. The need for more consistent and simpler regulatory requirements is clear.

The productivity and efficiency of laboratory operations could be increased by overt regulatory encouragement of laboratory procedures for reducing or destroying the hazard characteristic of haz-

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