coefficients of mineralization of humus and humic acids. Since the 1950s, nuclear tests in the atmosphere have increased significantly the ^{14}C concentrations, and calculation of ^{14}C age of soil organic matter is not possible because the specific activity of humus is higher than the specific activity of the NBS standard. However, knowing the coefficients of humus mineralization change of ^{14}C activity in the atmosphere and the specific activity of humus, we can reconstruct the ages of different soils.

IDENTIFICATION OF LANDFILL GAS USING RADIOCARBON DATING

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The microbial decomposition of organic materials in landfills produces large quantities of methane. Landfill methane has been identified as a significant contributor to the Greenhouse Effect, and can result in hazardous situations if it migrates off-site. It is now also considered a potential energy resource. Thus, control of methane emissions from landfills is of environmental as well as of economic interest. Methane, the primary component of landfill gas, is also the primary component of natural gas, coal gas and marsh gas. Landfill gas generally contains high concentrations of carbon dioxide and may contain heavy organic compounds, such as vinyl chloride. Although gases from different sources can sometimes be distinguished by their chemical compositions, the chemical composition of gas can change as it migrates through the subsurface. Thus, chemical analysis alone does not always provide a method of identifying gas that has originated in a landfill.

Much of the organic material that decomposes in a landfill contains elevated ^{14}C concentrations as a result of atmospheric testing of nuclear weapons in the 1950s and early 1960s. Thus, ^{14}C analysis provides a definitive method for distinguishing landfill methane from methane derived from many other sources. The data presented show that ^{14}C analysis of both methane and carbon dioxide, when combined with chemical and stable isotope analyses, can provide information about the environment through which the gas has passed as well as about the migration pathway.

A ^{14}C DATING PROTOCOL FOR USE WITH PACKARD SCINTILLATION COUNTERS EMPLOYING BURST COUNTING CIRCUITRY

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Considerable research has been carried out in this laboratory into the use of Packard scintillation counters employing burst counting circuitry. The nature of the pulse-shape discrimination circuit has led to a redefinition of our sample vialing philosophy and scintillation cocktail optimization. Results are presented to demonstrate:

1. How efficiency may be enhanced with a two-component cocktail compared with the use of a primary fluor only
2. How a cocktail was developed in which efficiency and quenching were relatively unaffected by variations in the cocktail ratio
3. The rationale behind the use of screw-cap vials rather than sealable ampules
4. The advantage of using nickel/chromium-plated brass caps compared with standard plastic caps.