

## RADIOCARBON MEASUREMENTS IN SOUTH PACIFIC OCEAN WATERS IN THE VICINITY OF THE SUBTROPICAL CONVERGENCE ZONE

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Radiocarbon distribution profiles have been measured along three transects in the southern Pacific, two east of New Zealand and one east of Tasmania. Use of accelerator mass spectrometry (AMS), with its small-sample-size capability, made it possible to sample near-surface waters with a depth resolution of a few tens of meters. Sampling of deeper water was guided by salinity and temperature data transmitted by a CTD probe. In the case of measurements taken over the Chatham Rise, east of New Zealand, the radiocarbon profiles are highly structured, and can be correlated with known circulation patterns in this region. The other two sets of data are less influenced by the local bathymetry, and show profiles more typical of the deep ocean. The results will be discussed in terms of the rate of penetration of bomb-radiocarbon they imply, and their significance for ocean-atmosphere exchange of carbon dioxide.

## THE INFLUENCE OF RADON IN BENZENE SYNTHESIS FOR RADIOCARBON AGE DATING

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Previous research presented at the 1988 Dubrovnik Conference documented the interference caused by the incorporation of  $^{226}\text{Ra}$  and  $^{222}\text{Rn}$  as natural contaminants in radiocarbon age dating using very low background liquid scintillation counting techniques (Hood *et al* 1989). Although it was demonstrated that the use of vacuum and dry-ice alcohol temperatures during the catalyst extraction of sample benzene appeared to eliminate the radon, it raised concern in our laboratory. We decided to investigate further the problem of radon in benzene synthesis. Since radon is quite soluble in organic solvents commonly used in liquid scintillation counting, such as benzene, we primarily studied the uptake of radon by benzene open to the atmosphere. The different chemical reagents were studied as sources of radon in benzene, such as oxygen stored in steel cylinders, the sample itself, water for carbide hydrolysis, and the catalyst used to trimerize acetylene to benzene. Also presented will be the spectra of beta-emitting daughter products of the  $^{226}\text{Ra}$  decay series and their interference in the  $^{14}\text{C}$  counting region of interest.

### REFERENCE

- Hood, D, Hatfield, R, Patrick, C, Stipp, J, Tamers, M, Leidl, R, Lyons, B, Polach, H, Robertson, S and Zhou, W 1989 Radon elimination during benzene preparation for radiocarbon dating by liquid scintillation spectrometry. *In* Long, A and Kra, RS, eds, International  $^{14}\text{C}$  conf, 13th, Proc. *Radiocarbon* 31(3): 254-259.