

Ohkouchi, N., Xu, L., Reddy, C.M., Montluçon, D., and Eglinton, T.I.,
Radiocarbon dating of alkenones from marine sediments: I. Isolation protocol,
Radiocarbon, 2005; v47, pp. 401-412

The chemical and isotopic compositions of long-chain (C36–C39) unsaturated ketones (alkenones), a unique class of algal lipids, encode surface ocean properties useful for paleoceanographic reconstruction. Recently, we have sought to extend the utility of alkenones as oceanic tracers through measurement of their radiocarbon contents. Here, we describe a method for isolation of alkenones from sediments as a compound class based on a sequence of wet chemical techniques. The steps involved, which include silica gel column chromatography, urea adduction, and silver nitrate-silica gel column chromatography, exploit various structural attributes of the alkenones. Amounts of purified alkenones estimated by GC/FID measurements were highly correlated with CO₂ yields after sample combustion, indicating purities of greater than 90% for samples containing ≥ 100 $\mu\text{g C}$. The degree of alkenone unsaturation (UK'37) also varied minimally through the procedure. We also describe a high-performance liquid chromatography (HPLC) method to isolate individual alkenones for molecular-level structural and isotopic determination.