

Johnson, C.G., Frysinger, G.S., Nelson, R.K., Gaines, R.B., Ohkouchi, N., Reddy, C.M., and Eglinton, T.I., *Innovative methods for determining alkenone unsaturation ratios*, Marine Chemistry, 2003; v83, 5-22

Stds., total lipid exts. and crudely fractionated samples as well as extensively purified alkenone refs. were analyzed by conventional single column gas chromatog. (GC), selective 2-dimensional GC (GC-GC), comprehensive 2-dimensional GC (GC x GC) and high resoln. mass spectrometry (HRMS). U37K' indexes, defined as  $[C37:2]/[C37:2 + C37:3]$ , for independently analyzed stds. showed GC-GC av. accuracy of 0.014 and precision  $\pm 0.008$  and HRMS av. accuracy of 0.001 and precision  $\pm 0.007$ . The HRMS limit of precision is approx.  $\pm 0.008$  for real world samples applied to the MS probe at greater than a few nanograms of the lesser alkenone component. Both of the two-dimensional GC techniques and HRMS indicate the presence of coeluting compds. in typical alkenone fractions that are not resolved by single dimensional GC. U37K' indexes measured by GC-GC, GCxGC and HRMS for total lipid exts. were generally obsd. to have lower U37K' indexes than their purified alkenone fractions.