

UPPER EOCENE SPHERULES AT ODP SITE 1090B. S. Liu¹, F. T. Kyte², B. P. Glass¹, and R. Gersonde³,
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Our two labs independently discovered upper Eocene microtektites and microkrystites at ODP Site 1090, a new South Atlantic locality near the Agulhus Ridge. This is a significant new data point for the strewn fields of these spherules, which were recently extended into the Atlantic sector of the Southern Ocean when they were reported at ODP Site 689 on the Maude Rise [1,2]. The microtektites have been regarded as related to North American tektites and the microkrystites as belonging to the clinopyroxene-bearing (cpx) spherule strewn field [2,3].

Initial reports [4] indicate that Site 1090 contains a complete sequence of upper Eocene sediments composed of diatom and nannofossil oozes. The magneto- and bio-stratigraphy indicate that impact-age sediments should occur in core 30X of Hole 1090B. One of us (FTK) took 2 cc samples at 10 cm intervals over 600 cm of core for Ir analyses and the senior author (SL) took 3 cc samples at 20 cm intervals to search for spherules. Both studies proved successful and additional samples were obtained to confirm initial results and better define the Ir anomaly and spherule abundances. Peak Ir concentrations of 0.97 ng/g were found at 1090B-30X-5, 105–106 cm and 0.78 ng/g at 115–116 cm. Anomalous Ir concentrations (>0.1 ng/g) extend over about 100 cm of core. Preliminary results indicate that the excess Ir at this site is about 25 ng/cm². About 380 microtektites (>63 μ m) and 2492 microkrystites (>63 μ m) were recovered over a 1.8 m interval with a peak abundance of microtektites (106 /gram) and microkrystites (562 /gram) at 1090B-30X-5, 114–115 cm. The largest microtektite is $\sim 960 \times 1140$ μ m in size. About 55% are spherical, and the rest are disc, cylinder, dumbbell, teardrop, or fragments. Most of the microtektites are transparent col-

orless, but a few are transparent pale brown or green. Preliminary data indicate that the microtektites at Site 1090 have similar major oxide compositions to those at Site 689. About 50% of the cpx spherules are spherical, the rest are fragments. They range from yellowish translucent to dark opaque.

Based on stratigraphic data, occurrence of a positive Ir anomaly, and similar appearance and major oxide compositions of the Site 1090 spherules to those at Site 689, we believe that the spherule layer(s) are the same at both sites. However, there are significant differences between these two sites. At Site 689 the peak abundance of the cpx spherules is slightly below that of the microtektites. We can distinguish no such separation at Site 1090, despite a somewhat higher sediment accumulation rates. Peak Ir concentrations are about four times higher at Site 1090, resulting in a similarly higher total flux of Ir for this site compared to Site 689 on the Maude Rise [1]. This is generally consistent with the flux of cpx spherules (>63 μ m) which is estimated to be ~ 2100 /cm², about twice that of Site 689D (1040/cm²) and with the cpx-spherule component being a principal carrier of the Ir signal. The number of microtektites/cm² (>63 μ m) is nearly the same at both sites, ~ 300 in 1090B and 280 in 689B. A decrease in the >63 μ m size fraction (consisting primarily of diatoms and radiolaria) is coincident with the spherule layer at both sites suggesting that the impact(s) that produced the spherule layer(s) may have had an adverse affect on the marine plankton.

References: [1] Montanari A. et al. (1993) *Palaios*, 8, 420–437. [2] Vonhof H. B. (1998) Ph.D. thesis, The Netherlands, 138 pp. [3] Glass B. P. and Koeberl C. (1999) *MAPS*, 34, 197–208. [4] Gersonde R. et al. (1999) *Proceedings ODP*, 177.