COMPOSITION AND PETROGRAPHY OF A MUONG NONG-TYPE GEORGIA TEKTITE; B. P. Glass, Geology Department, University of Delaware, Newark, DE 19716; C. Koeberl, Institute of Geochemistry, University of Vienna, A-1010 Vienna, Austria; H. Povenmire, 215 Osage Drive, Indian Harbour Beach, FL 32937.

A Muong Nong-type (MN) tektite was recently found in Washington County, Georgia, just south of Riddleville. This is the first MN tektite to be found in Georgia. It is also the largest Georgia tektite known and it is the only North American tektite known to contain zircons in addition to baddeleyite. Because of the uniqueness of the specimen a consortium was established to study it [1]. This report deals only with the composition and petrography.

An end piece weighing 5.2 g was cut off the specimen and then four 1-2 mm thick slices were cut. One slice was cut into four subsamples and given to members of the consortium. The slices show layering due to variations in color of the glass. The layering varies from indistinct and broadly curving to sharp and folded. The specimen exhibits extreme strain birefringence. Vesicles are generally common to abundant, but most are < 200 μm in diameter and are therefore not obvious to the unaided eye. The largest vesicle observed is 740 μm in diameter. Lechatelierite is common and ranges from more or less equant to long (up to several millimeters) filamentous, highly-contorted inclusions. Some of the lechatelierite is bubbly, but frothy lechatelierite was not observed. Numerous rounded, white opaque inclusions, generally between 20-60 μm in size, were observed in each slice, otherwise the specimen is free of crystalline material. The end piece was crushed, sieved into two fractions (74-149 μm and < 74 μm). The 74-149 μm size fraction was divided into different specific gravity fractions using heavy liquids in order to recover mineral inclusions and glasses of different composition. Nine glass fragments, each containing one white opaque inclusion, were recovered. The inclusions were similar in appearance to those observed in the slices. X-ray diffraction patterns, obtained using a Debye-Scherrer camera, indicate that all the white opaque inclusions are zircon, baddeleyite, or mixtures of zircon and baddeleyite.

Major oxide compositions were determined for numerous glass fragments from each of the specific gravity fractions using energy dispersive x-ray analysis. The SiO_2 content was found to vary from 67 to 88%. The range in composition is greater than for all the previously analyzed North American tektites combined; however, the oxide vs. silica trends are well defined and for a given SiO_2 content the weight percent of the other oxides are similar to those of previously analyzed North American tektites.

Some preliminary trace element data have been obtained for the Muong Nong-type Georgia tektite (MNGATek) using instrumental neutron-activation analysis (INAA) (see [2] for INAA technique and element precision) (Table 1). Unfortunately, very little trace element data have been published for North American tektites. No As, Au, Br, or Sb data are available for Georgia tektites. The Ga concentration of the MNGaTek is within the range previously reported for Georgia tektites. As would be expected, the As, Br, and Sb concentrations are closer to those of bediasites than to MN Australasian tektites (Table 1).

Three measurements of the water content of the MNGaTek were made using a Perking Elmer 1760X Fourier-transform-IR spectrometer. The specimen appears to be homogeneous at a 2-3 mm resolution with a water content of 0.007 wt. %. The water content of Georgia tektites is not known, but 0.007 wt. % is slightly lower than published values for most bediasites [6].

Muong Nong-type tektites are generally regarded as having formed at lower temperatures than the splash form tektites [7]. However, the lack of frothy lechatelierite and coesite and the fact that many of the zircons were converted either partly or completely to baddeleyite, and the higher water content compared with Muong Nong-type Australasian tektites indicate that this specimen was subjected to higher temperature than previously described MN Australasian tektites with crystalline inclusions [8]. The discovery of this specimen in the most northeastern part of the strewn field is consistent with previous suggestions that the source crater is probably on the Atlantic coastal plain or continental margin off the northeastern United States [9].

References. [1] Povenmire H. et al. LPS XXV (this volume). [2] Koeberl C. et al. (1984). Proc. Lunar Planet. Sci. Conf. 15th, C351. [3] Cuttitta F. et al. (1969) JGR, 72, 1343. [4] Weinke H. H. and C. Koeberl (1985) Meteoritics, 20, 783. [5] Glass B. P. and C. Koeberl (1989) Meteoritics, 24, 143. [6] Gilchrist J. et al. (1969) JGR, 74, 1475. [7] Koeberl C. (1989) Proc. 2nd Intern. Conf. Natural Glasses, Charles Univ.; Prague, p. 371. [8] Glass B. P. and R. A. Barlow (1979) Meteoritics, 14, 55. [9] Koeberl C. and B. P. Glass (1988) Earth Planet. Sci. Lett., 87, 286

Table 1. Trace Element abundances (ppm) for Muong Nong-type Georgia tektite (MNGaTek), selected North American tektites, and five Muong Nong-type (MN) Australasian tektites.

	MNGaTek	Georgia Tektites [3]	Bediasites [4] BED8401	Bediasites [4] BED8402	MN Australasian [5]
As	0.29		1	0.8	3.5 - 6.1
Au	0.3		-	-	0.8 - 1.6
Ga	9.3	5.7 - 10	-	-	10.0 - 21.8
Br	0.02		0.1	-	3.0 - 6.1
Sb	0.087		0.05	0.05	0.65 - 1.10