Investigation of the Glassy Objects from ODP Leg 175, Hole 1082C

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Introduction: The formation of the Australasian tektites (AAT) corresponds to prior to the Matuyama-Brunhes transition (773 ka) [1]. Here we investigated the glassy objects found in the previous study [2] in the marine sediment in the South Atlantic that is outside of the AAT strewnfield.

Our investigation was carried out on the marine clay sediments from ODP Leg 175, Hole 1082C near the Walvis Basin, South Atlantic. The depth of the 40 cm u-channel (2x2 cm) sediment sample is between 81.4 and 81.8 mcd from the study of [3].

Methods and Results: Short-irradiation INAA measurements were done to determine the concentration of elements in the glassy objects. Major element oxide compositions of tektites reported in [4] are: SiO_2 (65-77 wt%), Al_2O_3 (8-16 wt%), FeO (1-6 wt%), MgO (1-4 wt%). The INAA results in this study showed the prevalence of Al_2O_3 (40-50 wt%) concentration in most of the samples.

Discussion and Conclusion: Tektites were found in different locations in the AAT strewnfield [5, 6, 7, 8, 9]. The source of the AAT is a meteorite impact that occurred in Asia about 788 kyr ago [10]. There is a general consensus to locate their parent impact crater in Indochina, within or close to the densest occurrence of the AAT, but [11] argued against it and suggested a crater in the desert area of Northwest China. The beginning of the M/B magnetic reversal is close to the positions of the AAT layer in the deep-sea sediments [12, 13, 14]. Also, the relationship between the AAT and the Matuyama-Brunhes transition was discussed [12, 15, 16].

The location of the ocean sediment is relatively far from the AAT strewnfield, while it is closer to the Ivory Coast strewnfield. On the other hand, the age of the sediment (795 kyr) is younger than the Ivory Coast tektites (1.07 Ma) [17]. Our further investigation will determine the origin of the glassy objects whether they were caused by AAT formation.

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