



Sr-Nd isotope systematics as final evidence for the link between the North American tektite strewn field and the Chesapeake impact structure

Alex Deutsch

Institut f. Planetologie, Wilhelm-Klemm-Str. 10, D-48149 Muenster, Germany
(deutschca@uni-muenster.de)

The ~35 Ma Chesapeake Bay impact structure is discussed as possible source crater for the North American tektites (NAT). New Sr-Nd isotope data for target lithologies, crater fill and post-impact sediments (drill core and outcrop samples) of the Chesapeake structure and NAT finally establish now this link. The Paleocene to middle Eocene target sediments have time-corrected epsilon Sr of +54 to +272, and epsilon Nd of -8.9 to -10.8. One granite clast with a Nd CHUR model age of 1.36 Ga has epsilon Sr +188, and epsilon Nd of -5.7. The crater fill (Exmore) breccia represent a mix of the analyzed target sediments lithologies. In contrast, the post-impact Chickahominy sediments display slightly higher Nd model ages of about 1.55 Ga, reflecting the addition of “exotic” older materials.

In excellent agreement with published data for samples of the NAT strewn field, newly analyzed bediasites have the following isotope parameters: +104 to +119 (epsilon Sr at 35 Ma), -5.7 (epsilon Nd), a Sr model age of 0.47 Ga, and a Nd CHUR model age of 1.15 Ga. None of our samples resulted in highly radiogenic Sr isotopic compositions as known for the tektites from DSDP site 612. The new isotope data exclude any relation between the NA tektites and the Popigai impact crater, having within 2σ errors identical ages of 35 Ma. The Chesapeake Bay structure, however, is now clearly constrained as the source crater for the North American tektites, although the present data set obviously does not include all target lithologies that have contributed to the composition of the tektites.