THE STEINHEIM SUEVITE. E. Buchner[1] and M. Schmieder. Institut für Planetologie, Universität Stuttgart, Herdweg 51, 70174 Stuttgart, Germany. [1]E-mail: elmar.buchner@geologie.uni-stuttgart.de

Introduction: The 3.8 km Steinheim Basin [1] in SW Germany is a complex impact crater with central uplift thought to have formed simultaneously with the 24 km and 14.4 Ma Ries crater [2,3] by the impact of a double asteroid. The crater is hosted by a sequence of Triassic to Jurassic sedimentary rocks [e.g., 2]. The Steinheim Basin exhibits a well-preserved crater morphology, intensely brecciated limestone blocks that formed the crater rim and shatter cones in limestones of excellent quality. In addition, a fall-back breccia ('Primäre Beckenbrekzie') mainly composed of Middle and Upper Jurassic limestones, marls, and sandstones is known from drillings in the Steinheim Basin [1,4].

Samples and Observations: The samples were taken from a drill core (B26, depth 76-77 m) that was constructed in the 1970s [1] at the flank of the central uplift and went through 'Primäre Beckenbrekzie' and the crater floor. We recently discovered small particles (mm in size) in the basin breccia that turned out to represent glass particles now altered and transformed into phyllosilicates. The altered glass particles are rich in SiO_2 (~50%), Al_2O_3 (~22%), CaO (~12%), and contain Fe-sulfides rich in Ni (up to 1.2%) and Co (up to 0.1%) [5], as well as target rock clasts (shocked and unshocked quartz, feldspar, limestone) and recrystallized droplets of calcite [6]. The melt particles exhibit distinct flow structures and relicts of schlieren and blasen (Fig. 1).

Conclusions: No impact melt lithologies have so far been reported from the Steinheim Basin. Due to the geochemical composition and the textural features, we interpret the particles analyzed as melt fragments widely recrystallized and/or altered. On the basis of impactite nomenclature, layers of glass-bearing impact breccias in the drill core studied can be denominated as Steinheim suevite. The geochemical character of the altered glass particles (high amount of Fe and Ti) point to Middle Jurassic sandstones ('Eisensandstein') that crop out in the central uplift as the source for the melt fragments.

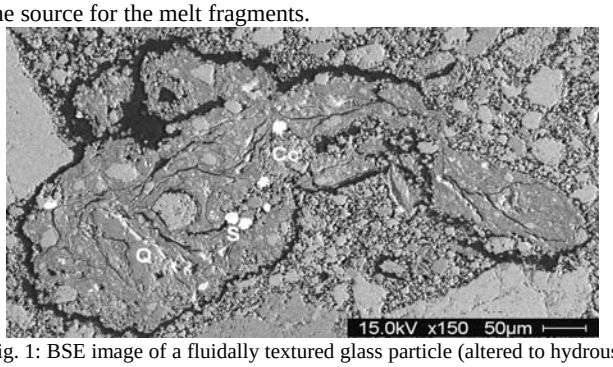

Fig. 1: BSE image of a fluidally textured glass particle (altered to hydrous phyllosilicates) in Steinheim suevite (drill core B26); Q: quartz grain, Cc: droplet of recrystallized calcite; S: Fe-sulfides rich in Ni and Co.

References: [1] Reiff W. and Groschopf P. 1979. *Guidebook to the Steinheim Basin impact crater*, p. 9-18. [2] Ivanov B. A. and Stöffler D. 2005. Abstract #1443. 36th Lunar and Planetary Science Conference. [3] Stöffler D. et al. 2002. *Meteoritics & Planetary Science* 37:1893-1907. [4] Heizmann E. P. J. and Reiff W. 2002. *Der Steinheimer Meteorkrater*, 160 p. [5] Schmieder M. and Buchner E. 2009. This volume. [6] Buchner E. and Schmieder M. 2009. This volume.