A TRIASSIC/JURASSIC BOUNDARY AGE FOR THE ROCHECHOUART IMPACT STRUCTURE (FRANCE).

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Introduction: The age of the ~23 km in diameter Rochechouart impact structure, France, hosted by Precambrian to Paleozoic (Variscan) crystalline rocks of the northwestern French Massif Central, has long time been a matter of debate. Previous studies, including K-Ar, Rb-Sr, apatite and glass fission track, as well as paleomagnetic dating (see [1] for summary of ages), resulted in a broad (Middle Triassic to Late Jurassic) time window for the Rochechouart impact. More recently, $^{40}Ar/^{39}Ar$ laser dating of pseudotachylites from Champagnac yielded a 214 ± 8 Ma Late Triassic age [1] currently accepted as the most robust impact age, supporting the theory that Rochechouart is a member of a ~214 Ma terrestrial impact crater chain [2]. Precise and accurate dating is critical to this interpretation and, furthermore, essential as regards the proximity and possible influence of the nearby Triassic to Jurassic shoreline and/or sediments upon crater formation and vice versa. We here present new $^{40}Ar/^{39}Ar$ age data for the Rochechouart impact structure.

Samples and Dating: Optically fresh aggregates of sanidine and adularia crystals separated from impact-metamorphosed gneiss found near Videix were chosen as material for dating. Optical and XRD analyses suggest that sanidine represents recrystallized domains of monomineralic K-feldspar glass, whereas idiomorphic adularia formed as a post-shock hydrothermal (K-metasomatic) phase within cavities. $^{40}Ar/^{39}Ar$ dating was done at the University of Heidelberg [3,4].

Results and Interpretation: $^{40}Ar/^{39}Ar$ step-heating analysis yielded two plateau ages of 201.4 ± 2.4 Ma (2σ; MSWD=1.07, *P*=0.38) for sanidine (~19-99% of ^{39}Ar released; 8 steps) and 200.5 ± 2.2 Ma (2σ; MSWD=0.21, *P*=0.99) for adularia (~24-100% of ^{39}Ar; 9 steps), respectively. Except for some younger apparent ages in the low-temperature extractions, both plateaux show concordant step ages that overlap at the 95% confidence level. Inverse isochron plots show a $^{36}Ar/^{40}Ar$ intercept at ~0.0035 for sanidine and ~0.0034 for adularia, which suggests that the samples are not disturbed by inherited ^{40}Ar or secondary ^{40}Ar loss [5]. Our new sanidine and adularia $^{40}Ar/^{39}Ar$ ages for Rochechouart are in agreement with former dating results [1] and, within error, indistinguishable from the 201.7 ± 0.6 Ma $^{206}Pb/^{238}U$ [6] and 197.8 ± 0.7 to 201.7 ± 2.4 Ma $^{40}Ar/^{39}Ar$ [7] ages for the Triassic/Jurassic boundary. A Tr/J boundary age for Rochechouart is, moreover, incompatible with the postulated ~214 Ma multiple impact event [2] (see [8,9] for discussion).

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