

## **$^{40}\text{Ar}/^{39}\text{Ar}$ age of hornblende-bearing R chondrite LAP 04840**

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Chondrites have a complex chronology due to several variables affecting and operating on chondritic parent bodies such as radiogenic heating, pressure and temperature variation with depth, aqueous alteration, and shock or impact heating [1]. Unbrecciated chondrites can record ages from 4.56 to 4.4 Ga that represent cooling in small parent bodies. Some brecciated chondrites exhibit younger ages ( $\ll 4$  to 4.4 Ga) that may reflect the age of brecciation, disturbance, or shock and impact events ( $\ll 4$  Ga).

A unique R chondrite was recently found in the LaPaz Icefield of Antarctica – LAP 04840 [2]. This chondrite contains ~15% hornblende and trace amounts of biotite, making it the first of its kind. Studies have revealed an equigranular texture, mineral equilibria yielding equilibration near 650-700 °C and 250-500 bars, hornblende that is dominantly OH-bearing (very little Cl or F), and high D/H ratios [8,9,10]. To help gain a better understanding of the origin of this unique sample, we have measured the  $^{40}\text{Ar}/^{39}\text{Ar}$  age.

Age of 4.290  $\pm$  0.030 Ga is younger than one would expect for a sample that has cooled within a small body [4], and one might instead attribute the age to a younger shock event. On the other hand, there is no evidence for extensive shock in this meteorite (shock stage S2; [3]), so this sample may have been re-annealed after the shock event. This age is similar to Ar-Ar ages determined for some other R chondrites [5,6].

[1] Bogard (2011) *Chemie der Erde-Geoch.* **71**, 207-226. [2] Satterwhite and Righter (2006) *Ant. Met. Newsl.* 29, no. 1. [3] McCanta *et al* (2008). *GCA* **72**, 5757-5780. [4] Bennett and McSween (1996) *MaPS* **31**, 783-792. [5] Dixon *et al* (2003) *MaPS* **38**, 341-355. [6] Nagao *et al* (1999) *Ant. Met. Res.* **12**, 81-93.