RBT 04133: A NEW, UNUSUAL CARBONACEOUS CHONDRITE. J. Davidson[1], D. L. Schrader[2], H. Busemann[1,3], I. A. Franchi[1], H. C. Connolly Jr[2], D. S. Lauretta[2], C. M. O'D. Alexander[4], A. Verchovsky[1], M. A. Gilmour[1], R.C. Greenwood[1] and M. M. Grady[1], [1]PSSRI, Open University, UK. E-mail: j.davidson@open.ac.uk. [2]LPL, University of Arizona, USA. [3]SEAES, University of Manchester, UK. [4]DTM, Carnegie Institution of Washington, USA.

Introduction: The study of primitive carbonaceous chondrites is an important means of understanding the conditions of the early Solar System. We report new data on the Antarctic find RBT 04133, originally classified as a CR2 carbonaceous chondrite [1]. However, we show that RBT 04133 is not a CR and has affinities to the CV and CO carbonaceous chondrite groups.

Methods: We have characterized the petrography, chemistry, C, N, O, and H isotope compositions, and presolar grain abundances of RBT 04133. Bulk sample, insoluble organic matter (IOM) residue and a thin section (RBT 04133, 8) were analyzed.

Results: *Mineralogy and Petrology.* Modally, RBT consists of ~5% opaques (mostly sulphides), ~11% refractory inclusions, ~37% chondrules, and ~47% matrix (all vol.%). Chondrules (0.45-4.6 mm) are ~92% type I and ~8% type II; $Fa_{1.8\text{-}54.6}$, $Fs_{0.7\text{-}9.7}$ and $Wo_{0.88\text{-}4.7}$, and $Fs_{23.4\text{-}25.3}$ and $Wo_{49.2\text{-}51.1}$ (matrix is ~Fa_{51}). No phyllosilicates were observed. Opaques within chondrules and matrix are kamacite, taenite, and Ni-poor troilite. Ni and Co in metal are inversely correlated; suggesting thermal alteration. Petrology and compositional data suggest a CV3 classification.

Stable Isotope Analyses. C and N isotope analyses of both bulk sample and IOM were undertaken on the OU's *Finesse* mass spectrometer. $\delta^{13}C$ and $\delta^{15}N$ are -5.0±1‰ and -22.9±2‰, respectively, for the IOM. $\delta^{13}C$ agrees well with the COs, whilst $\delta^{15}N$ agrees with the COs and reduced CVs [2].

The amount of C in the IOM was calculated to be 69 wt. %. This value is most similar to the CRs but also agrees with the COs and reduced CVs [2].

Oxygen. High-precision oxygen isotopic measurements undertaken by laser fluorination [3] show bulk RBT 04133 plots near the CVs, with $\delta^{17}O$ of -3.32‰ and $\delta^{18}O$ of 0.21‰.

Presolar Isotope Anomalies. Presolar silicates, oxides, SiC, and anomalous C and N were detected using the OU's NanoSIMS 50L. CR chondrites have presolar SiC abundances of 25-55 ppm [4,5], similar to CI Orgueil (44 ppm, this work). A SiC abundance of ~10 ppm was calculated for RBT 04133: this is lower than we reported for the CRs but agrees with 10 ppm for the CO ALHA 77307 [4,5].

Raman Spectroscopy. MicroRaman spectroscopic analysis of the IOM at the OU revealed that the D and G features from RBT 04133 IOM plot between those from CVs and COs and are quite distinct from the more primitive CRs [6]. Thus, the IOM of RBT 04133 is less primitive than that of the CRs and may have experienced higher temperatures of ~450ºC [6].

Conclusions: Our current data suggest that RBT 04133 is a mildly thermally altered CV3 with some CO-like characteristics. Further work is intended to investigate these deviations.

References: [1] Weisberg et al. 2008. *MAPS* 43:1551–1588. [2] Alexander C. M. O'D. et al. 2007. *GCA* 71:4380-4403. [3] Miller M. F. et al. 1999. *Rapid Commun. Mass Spectrom.* 13: 1211-1217. [4] Davidson J. et al. 2008. Abstract #1184. 39th LPSC. [5] Davidson J. et al. 2009. Abstract #1853. 40th LPSC. [6] Busemann H. et al. 2007. *MAPS* 42:1387-1416.