GR095502 AND MET 96500: NEW HIGHLY UNEQUILIBRATED ORDINARY CHONDRITES. P.H. Benoit and D.W.G. Sears. Arkansas-Oklahoma Center for Space and Planetary Sciences. University of Arkansas, Fayetteville, AR, 72701 USA. <u>pbenoit@uark.edu</u>.

Ordinary chondrites have been frequently used as windows of primitive material in the solar system, although there has been speculation that they are possibly highly unrepresentative [1]. Unequilibrated ordinary chondrites provide insights into the early solar system, especially the least metamorphosed samples (type <3.3). In this study, we note the discovery of two low type 3 L chondrites in the Antarctic collection.

GR095502 (paired with GR0 95504, 95512, 95539, and 95544) and MET96500 (paired with MET 96515) were described as unequilibrated chondrites, notable for their numerous large chondrules (up to 3.3 mm diameter) [2]. MET96500 was described as weakly shocked. They were given a tentative classifications of ~3.5, based on petrography and the range of mineral composition. Analysis of induced thermoluminescence, however, shows that members of the GR095502 group had TL sensitivities of ~0.001 relative to the Dhajala meteorite (H3.8), and the MET96500 group have TL sensitivities of ~0.005, giving apparent type classifications of 3.0 and 3.1, respectively [3]. Induced TL peak temperature and width data are in accord with a type classification of <3.5.

We speculated that the discrepancy between the TL data and the classification from petrography might be due to weathering or shock processing. Shock converts feldspar, the primary TL phosphor, to non-luminescence glass, typically at shock stages >S4 [4]. Weathering also reduces TL sensitivity [5]. However, the present samples do not show petrographic evidence for such high shock levels, and weathering typically does not reduce apparent petrologic type more than 0.1 unit. In cathodoluminescence, these meteorites are very similar to Krymka (LL3.1), especially in the low abundance of A5 chondrules and the high abundance of B group chondrules [e.g., 6]. They differ, however, from Semarkona in their low abundance of group A1 chondrules.

While thus not among the very least metamorphosed chondrites, like the newly characterized NWA 505 [7], we conclude that these meteorites are highly unequilibrated, of type 3.1, GRO95502 being more unequilibrated than MET 96500. They are thus a promising source of new material for studies of the early solar system.

References: [1] Sears D.W.G. (1998) *Astrophys. J.* **498**, 773. [2] McCoy T. (1997) *Ant. Meteor. Newsletter*, **20(2)**; McCoy T. (1998) *Ant. Meteor. Newsletter* **21(2)**. [3] Sears *et al.* (1991) *Proc. Lunar Planet. Sci.* **21**, 493. [4] Haq *et al.* (1988) *GCA* **52**, 1679. [5] Benoit and Sears (1999) *JGR* **104**, 14,159. [6] DeHart *et al.* (1992) *GCA* **56**, 3791. [7] Lauretta *et al.* (2002) This meeting.