

ASTEROIDAL ORIGINS FOR CARBONACEOUS CHONDRITES. D. R. Ostrowski¹, D. W. G. Sears^{1,2}, C. H. S. Lacy^{1,3} and K. M. Gietzen¹. ¹Arkansas Center for Space and Planetary Sciences. *E-mail: dostrow@uark.edu*. ²Department of Chemistry and Biochemistry. ³Department of Physics, University of Arkansas.

Introduction: While it is generally assumed that C chondrites are related to C complex asteroids, relatively few details are available. The UV slope and weak water-related features at 0.7 μm , and 3.0 μm are available for comparison and close matches have been reported between asteroid 31 Euphrosyne with meteorite Belgica 7904 and between asteroid 704 Interamnia and Yamato 82162 [1]. CM chondrites have been linked to the G asteroids [2]. Here we have developed a method of comparison by using the slopes of the continua in their IR spectra.

Methods: Our asteroid database consists of IR spectra for 18 C and X complex asteroids we have collected with the NASA IRTF telescope on Mauna Kea, HI. Data for meteorites were taken from the NASA PDS database. Plots were prepared of the continuum slope between 1.8-2.5 μm against the continuum slope of 1.0-1.75 μm .

Results: On such "continuum plots" the chondrites plot in the same general region as the C and X complex asteroids.

The two CI chondrites in this study (Ivuna and Orgueil) showed poor agreement between data from different laboratories, presumably reflecting their heterogeneity, however the data do not readily connect them with either the C or X asteroids.

The CM chondrites plot with the X complex asteroids, especially the Xc class. Mighei and Nogoya are slight outliers but could be connected to the Xc or X asteroid classes.

Most of the remaining C chondrite classes plot in the C asteroid fields. The CR, CV, and CK chondrites are linked to the Cg, Cgh, or Ch asteroids. A group of Antarctic CI/CM chondrites are spectrally similar to the B and X classes.

Discussion: Continuum plots are a successful method for quantitatively comparing spectra for meteorites and asteroids. The number of individual classes of asteroid and C chondrites is large relative to the number of IR spectra available, so some of the data fields are poorly populated. However, based on existing data a number of new meteorite-asteroid links are proposed that are reasonable in terms of the known mineralogy of meteorites and proposed mineralogy of asteroids [3]

References: [1] Hiroi T. et al. 1993. *Science* 261:1016-1018. [2] Burbine T. H. 1998. *Meteoritics and Planetary Science* 33:253-258. [3] Ostrowski D. R. et al. 2009. *Meteoritics and Planetary Sciences* Submitted.