

MAGNETIC RECORD OF BJURBOLE METORITE-preliminary report. T. Adachi^{1,2}, G. Kletetschka^{1,2,3}, P. J. Wasilewski², Department of Physics, Catholic University of America, 200 Hannan Hall, Washington DC, USA, ²NASA Goddard Space Flight Center, Code 691, Greenbelt, MD, USA, ³Institute of Geology, Academy of Sciences of the Czech Republic, Prague, Czech Republic.

Introduction: Meteorites are the key to unlocking the mystery of the formation and evolution of our solar system. Significant information had been preserved in millimeter or less, sized chondrules embedded in meteorites. Here we present an approach to extract and interpret the information embodied in the magnetic record. Indicators to validate magnetic records of meteorites and recognizing contamination have been developed [1]. We push a step further to validate the heterogeneity of intensity and orientation. The paleointensity was estimated by applying the empirical scaling law proposed [2].

Method: A precision 3 axis stage enabled the preservation of orientation during extraction of millimeter sized chondrules from meteorite matrix. The stage was attached to a binocular microscope aiding precision during preservation of the orientation. The removed chondrules were transferred to one inch round glass slides for natural remanent magnetization (NRM), isothermal saturation magnetization (SIRM), and demagnetization measurements.

Results and Discussion: The paleointensity related [2] REM (Figure 1) of both chondrules and matrices ranges from 0.0005 to 0.1, and it is indicative of a paleointensity range from 0 to 0.5 mT with no apparent contamination. bc21 chondrule that has >0.01 values interpreted according to the suggested indicators by [1], is also not likely contaminated (stability in large AF). The measured magnetized direction for matrices and chondrules were plotted using the Stereonet produced by [3], and figures 2 and 3 show the heterogeneity of the NRM directions. In addition to the REM results, the heterogeneity of directions suggests that the recorded magnetic intensities and directions preserved the initial information acquired during the formation of chondrules or history of aggregation of the meteorite.

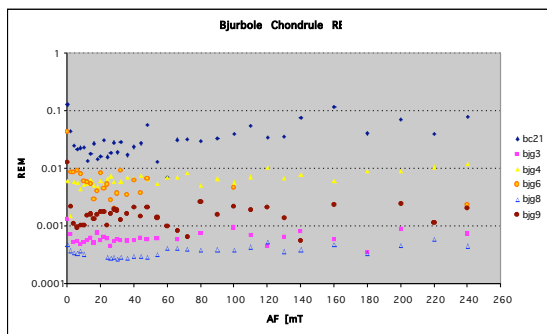


Figure 1: Resulted REM, the ratio of nrm to sirm at room temperature.

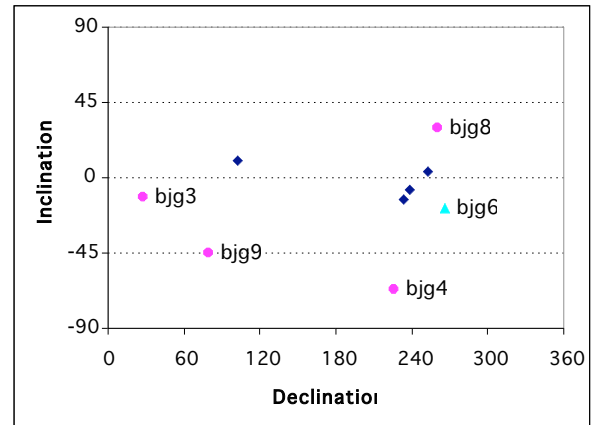


Figure 2: Averaged results of the magnetized direction in chondrules and matrices. Blue diamonds are matrices, pink circle are chondrule, and sky-blue triangle is a metal grain.

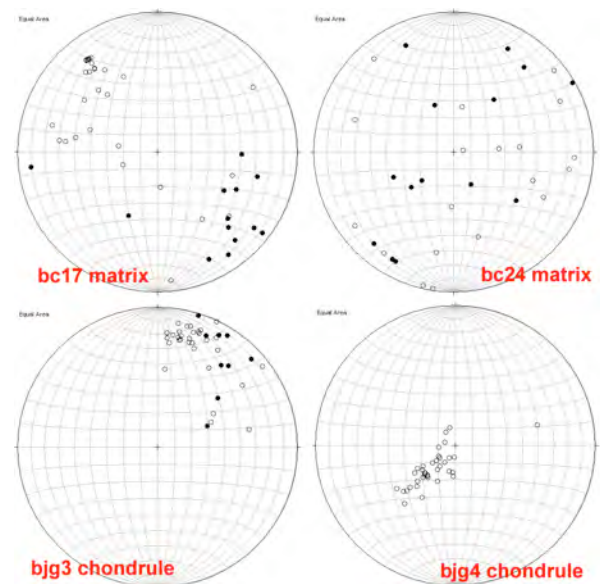


Figure 3: Stereonet projection of the inclination and declination of chondrules.

References: [1] Wasilewski and Dickinson (2000), *Meteoritics & Planetary Science* 35, 537-544, [2] Kletetschka et al. (2004) *Earth & Planetary Science Letters*, 226 (3-4), 521-528, [3] Stereonet Windows version (2003) produced by Richard W. Allmendinger.