EARLY INNER SOLAR SYSTEM CONDITIONS RECORDED IN NEW METEORITE NORTHWEST AFRICA (NWA) 14756. M. C. Rapoza[1] and S. W. Parman[2], [1]Colgate University Geology Department, Hamilton, NY, mrapoza@colgate.edu, [2]Brown University Department of Earth Environmental and Planetary Science, Providence, RI.

Introduction: The 4.5 billion year old building blocks of our modern day solar system, from the Sun to our very planet Earth, were meteorites. Some meteorites are unaltered and still preserve and record the conditions present during early solar system formation. One category of such meteorites, ordinary chondrites, are derived from the inner solar system. By looking at the bulk mineral composition of the new meteorite sample Northwest Africa (NWA) 14756 on a scanning electron microscope and comparing it to previously found data on similarly classified meteorites (LL ordinary chondrites), we can determine the temperatures, pressures, and other variable conditions that persisted at the time and place of NWA 14756's formation in the early solar system. LL ordinary chondrites are mostly unaltered, recording the precise conditions of the early inner solar systems. Here we show that the NWA 14756 meteorite collected in North West Africa does fit the generally accepted composition for low petrologically altered LL3 ordinary chondrites.

Our results reveal the NWA 14756 LL3.15 ordinary chondrite is primarily abundant in magnesium rich olivines, and pyroxenes, which demonstrates high pressure, high temperature conditions and highlights what the primitive solar system was composed of and how minerals were crystallizing. The sample was also rich in minor elements sodium (Na) and chromium (Cr). High sodium concentrations could be attributed to some aqueous alteration, and chromium enrichment in chondrules could be due to the evaporation of less refractory elements from the melt at high temperatures. We anticipate our research to add to current ordinary chondrite data and provide more evidence as to what the inner solar system was like in the beginning of planetary formation. Furthermore, learning about meteorites adds to our understanding of how celestial bodies like asteroids and planets formed, as well as how impacts have changed and influenced life and evolution of planets like Earth.

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