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Characterization of carbonaceous meteoritic fragments found in Antarctica by high-resolution Raman spectroscopy and SEM/EDS ANALIA DALL ASEN, BRANDON BAER, JAKE MITTELSTAEDT, Minnesota State University-Mankato, JORDAN GERTON, BENJAMIN BROMLEY, University of Utah, SCOTT KENYON, Smithsonian Astrophysical Observatory — Carbonaceous chondritic meteorites are composed mainly of chondrules (micro/millimeter-sized inclusions) surrounding by a matrix of microparticles, and are considered the most primitive surviving materials from the early Solar System. Understanding their properties and history may provide clues to the formation of planets from micron-size dust grains in the Solar nebula. Our approach is to study the structure and composition of carbonaceous chondrites with high-resolution micro-Raman spectroscopy, scanning electron microscopy and energy dispersive X-ray spectroscopy. These techniques enable us to capture details on a wide range of spatial scales, from micrometers to millimeters. Here we provide the first analysis of a set of meteorite fragments from Antarctica (MIL 07002 and ALH 84028), mapping elemental and molecular abundances, as well as large-scale morphological features. We present characterizations of individual chondrules and the surrounding matrix, and we consider on how our findings reflect physical processes believed to be operating during the early stages of planet formation.

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