

WEATHERING PATTERNS OF ORDINARY CHONDRITES FROM DIFFERENT LOCATIONS IN THE ATACAMA DESERT (CHILE).

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Introduction: Over the last years an interdisciplinary exhaustive study has been done with meteorite samples from the Atacama Desert (northern Chile), one of the oldest and driest desert of the world [1], in an attempt to understand the weathering processes acting on these primitive materials, the conditions of the accumulation surfaces that have preserved them, and compare these results with studies done with ordinary chondrites (OC's) from other hot desert areas [2, 3, 4, 5] that have shown important relations between their terrestrial ages and the weathering stage of their primary mineralogy.

Samples and Past Studies: The samples correspond to 34 OC's of the three chemical groups (H, L, and LL) and 1 carbonaceous chondrite (first CO discovered on this desert), 15 of them found in 3 recent expeditions. Their characterization was done using different approaches as magnetic and density measurements [6], Mössbauer spectroscopy (MS) and XRD [7, 8, 9], ¹⁴C terrestrial ages [10] and chemical analyses.

Accumulation surfaces conditions: The meteorite recovery surfaces are located in areas of the Atacama Desert with slightly different climatic conditions: A) one in the coastal domain (Pampa-La Yesera), with some moisture coming from the Pacific Ocean, and B) other areas spread through the central part of the desert (mainly San Juan and other single areas), with precipitation rates less than 2 mm/year, if any.

Oxidation-terrestrial age distributions: New data from low temperature MS [9] and ¹⁴C terrestrial ages [10], allowed the reconstruction of the oxidation-terrestrial age distributions for the different populations of Atacama OC's, that show a fluctuating oxidation pattern over time, with at least 3 peaks of high oxidation for San Juan area and at least 4 for the coastal domain, that are not all coincident between sites, reflecting differences in the humid-arid cycle of the Atacama, as pointed by [2] for other deserts. H chondrites are more highly weathered than L-LL chondrites for a given terrestrial age, in both sites. We will discuss the possible explanations of these behaviours in terms of the different parameters that affect weathering at the Atacama.

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