

MINERALOGY AND FLUID INCLUSIONS IN NITRATE DEPOSITS OF MARIA ELENA AND PEDRO DE VALDIVIA, II^a REGION, CHILE

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The nitrate deposits of María Elena and Pedro de Valdivia in the northern Atacama Desert, are located in the oriental part of the Coastal Cordillera, II^a Región, Chile. Nitrate ores occur as stratiform seams below the desert surface and are hosted mainly by breccias and sandstones which include important pieces of volcanoclastic and tuff materials. Salt minerals cement these clasts or form bandas of cm-m scale. The ore is largely composed of nitratite and halite with locally abundant thenardite, bloedite, hummerstonite, darapskite, anhydrite, polyhalite and niter. Other salts present include a variety of sulphates (bassanite, loewite, glauberite, mirabilite, hexahydrate, vanthofite, kieserite, woodwardite, lindakerite, wherryite, kogarkoite); iodates (dietzeite, lautarite, bruggenite); borates (ulexite, kaliborite, hilgardite, stroncioborite); chlorides (sylvite, nantokite) and the chromate mineral tarapacaite. Preliminary fluid inclusions studies show that the homogenization temperature in liquid rich type inclusions in nitratite and thenardite from the banded ores in these deposits vary between 118° to 265 °C. The salinity of the fluid phase varies between 1.9 to 10.6 Wt % of Na Cl equivalent. This points to the presence of thermal processes during salt formation. Therefore evaporation has not been the only mechanism of importance during the genesis of these salt deposits.