

CHARACTERIZATION OF INDIAN AND SOUTH AMERICAN EMERALDS AND GEOLOGY OF RAJASTHAN EMERALD BELT

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The western Indian State of Rajasthan has been the source of big, quality emeralds for centuries. Rich hauls of gems were recovered from placer and mother loads in the schists associated with the belt of ultramafic rocks in the Precambrian formations. Modern mining started in 1943, and now the mining activity is at standstill. Jaipur, Rajasthan, is one of the most important trading and gem cutting centers of the World. Jewelers periodically approach us to identify stones; lately the need to distinguish between the Indian (re-cut) and South American gems has been felt. Two non-destructive techniques proved diagnostic. Studied South American samples showed halite bearing aqueous fluid inclusions and they display strong red fluorescence, where as the Rajasthan (Indian) emeralds contain carbonic fluid inclusions and do not show red fluorescence. With the help of these two non-ruinous techniques it is possible to identify the source of the gems. Similar characterization of emeralds from various locations of the World would be of great importance. Additionally, record of photomicrographs of fluid inclusions in a gem can serve as its identification mark (fingerprint) in event of its loss or theft. Emerald mineralization, in Rajasthan, occurs in biotite- / talc-chlorite - / actinolite \pm hornblende schists that are associated with altered ultramafic rock intruding the Precambrian metasediments; close association of pegmatites is the second locus for its prospecting.