

Cerium silver oxide mineral from the pyrometamorphic rocks of Jordan

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Introduction

The pyrometamorphic rocks cover thousands of square kilometers and belong to the Muwaqqar Chalk Marl Formation (MCM) of upper Cretaceous age. The rocks are enriched with rare earth elements (REE). The EDS/ ICP-ES quantitative results of the rare earth elements (REE) have indicated for the first time the presence of a naturally occurring cerium silver oxide mineral. A representative figure is shown below

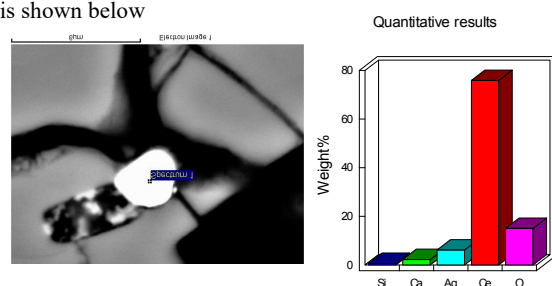


Figure 1: Representative EDS results of a single cerium oxide crystal.

Results and Discussion

Unusual pyrometamorphic varicolored marbles are associated with the bituminous marl (kerogen-rich biomicrites) and Pleistocene travertine. Recently, new minerals were discovered among which tululite, CaCd-oxide, phosphide-bearing minerals, Ba–Sr phosphate sulfate and calcium uranate phases [1,2,3,4,5,6]. The formation of cerium silver oxide phase in the varicolored marble of central Jordan is the result of combustion of the bituminous marl.. Light rare earth elements (LREE) are dominated by La and Ce and are enriched as a result of its liberation and mobilization from the source rocks (phosphorite, bituminous marl and varicolored marble) by the action of circulating alkaline hydroxide water.

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