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1 Petrogenesis of polygenic marbles, Baqi-Abad region, Yazd, Central Iran

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8 **Abstract:**

9 Mineralogy, minerals paragenesis and evolution of polygenic marbles were investigated in
10 the Baqi-Abad region (Yazd province). The area is located in the central Iran. Studied
11 marbles are classified as calcitic marbles, brucite-bearing marbles and forsterite- serpentine
12 bearing marbles. The following mineral assemblages have been determined: calcite +
13 dolomite + forsterite + serpentine + talc + brucite + hydromagnesite. Based on calcite twin's
14 geometry, marbles underwent the temperature formation between 200 to 300 ° C. Two
15 mineral assemblages which have been defined in marbles are related to two stages of contact-
16 metamorphism and metasomatism. In the first stage, de-carbonation reactions have been
17 taken place in high f_{CO_2} so anhydrous minerals are formed. The Second stage is
18 characterized by invading H₂O bearing fluids, leading to the formation of hydrous
19 paragenesis. Brucite is probably formed by the de-silicification of serpentines at the first
20 stage. On the other hand, due to the influence of hydrothermal fluids, olivines can be directly
21 altered to brucite. It is obvious that hydromagnesite was formed at the expense of dolomite,
22 brucite and serpentine. Its formation is associated with final carbonation reactions. As a
23 whole, it can be concluded that based on the paragenetic relationships of minerals, there are
24 four stages in mineral evolution system including carbonation, dehydration, de-carbonation
25 and final dehydration processes.

26 **Keywords:** brucite, hydromagnesite, marble, Baqi-Abad, Yazd, Central Iran

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