

Mg-phengite syngenetically formed from hydrothermal fluid : micro-textural evidence and mineral chemistry

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We report authigenic Mg-phengite series minerals as a lath form of single crystal and a large aggregate with micro-sized grains in a dolomite-pebble bearing fine sand-sized dolostone, so-called the representative rock of the Haengmae Formation, South Korea. Based on micro-textural observation, Mg-phengite is mainly observed as a form surrounding the detrital grains and a precipitate filling pore spaces in the clastic carbonate-dominant host rock. The structural formula based on $O_{10}(OH)_2$ shows that the number of Mg per formula unit (p.f.u.) ranges from 0.1 to 0.6 (average = 0.5), which is relatively high, compared with the previously reported metamorphic phengites. In the trace and rare earth elements mineral chemistry, Mg-phengite series is characterized by the enrichment of some incompatible elements and rare earth elements (REEs). Especially, light rare earth elements (LREEs) are more enriched in the polycrystalline aggregates of Mg-phengite. This occurrence strongly suggests that Mg-phengite is formed syngenetically or during early diagenesis by the infiltration of hydrothermal fluid in the carbonate sedimentary rock (Haengmae Fm.) as a stratabound form.