

## A NEW Mn<sup>2+</sup>-ALLANITE FROM THE VEITSCH Mn DEPOSIT?

Tropper, P.<sup>1</sup>, Essene, E.<sup>2</sup>, Rhede, D.<sup>3</sup>, Ettinger, K.<sup>4</sup>, Walter, F.<sup>4</sup> & Postl, W.<sup>5</sup>

<sup>1</sup>Faculty of Geo- and Atmospheric Sciences, Institute of Mineralogy and Petrography, University of Innsbruck, Innrain 52, A-6020 Innsbruck, Austria

<sup>2</sup>Department of Geological Sciences, University of Michigan, Ann Arbor, 48109, Michigan, USA

<sup>3</sup>GeoForschungsZentrum Potsdam, Telegrafenberg, D-14473 Potsdam, Germany

<sup>4</sup>Institute of Mineralogy and Petrology, University of Graz, Universitätsplatz 2, A-8010 Graz, Austria

<sup>5</sup>Landesmuseum Joanneum, Referat für Mineralogie, Raubergasse 10, A-8010 Graz, Austria  
email: peter.tropper@uibk.ac.at

Several carbonate-hosted Fe and Mn ore deposits occur within the upper Austroalpine Grewyacke Zone. The Mn deposit of Veitsch at the Kaskogel and north of the Friedelkogel consists of lens-shaped carbonate bodies of ca. 1.5 m in length, which are thought to have formed as sedimentary or submarine hydrothermal Mn-deposits. The manganese silicates described from this deposit are: tephroite, pyroxmangite, spessartine, Mn-chlorite, Mn-humite and friedellite (POSTL et al., 1998). Sulfides such as sphalerite, galena, chalcopyrite and Co-Ni sulfides also occur. In addition, POSTL et al. (1998) and NIEDERMAYR et al. (2000) described rare minerals such as helvine and sussexite from this deposit.

During this investigation, in one rhodochrosite sample an unusual REE-Mn-bearing allanite mineral was found. The allanite occurs in a veinlet with the mineral assemblage REE-Mn-allanite + tephroite + spessartine + Mn-chlorite + rhodochrosite + kutnahorite + serpentine. The REE varies between 1.5 and 1.8 a.p.f.u., and Mn ranges from 1.2 to 1.5 a.p.f.u. The BSE images and chemical analysis reveal a complex zoning of the mineral with increasing Fe<sub>2</sub>O<sub>3</sub>, MnO and decreasing Al<sub>2</sub>O<sub>3</sub> and CaO towards the rim, whereas the REE are unzoned. Charge balance considerations and site assignments indicate that the fraction of Mn<sup>3+</sup> is very low (<0.2 a.p.f.u.). With such low Mn<sup>3+</sup> the mineral is not a manganoan piemontite but most likely a REE-Mn<sup>2+</sup>allanite [CaREE(Mn<sup>2+</sup>)(Al,Fe<sup>3+</sup>)<sub>2</sub>Si<sub>3</sub>O<sub>12</sub>(OH)], with some androsite [MnREE(Mn<sup>2+</sup>)(R<sup>3+</sup>)<sub>2</sub>Si<sub>3</sub>O<sub>12</sub>(OH)], dissakisite [CaREEMgAl<sub>2</sub>Si<sub>3</sub>O<sub>12</sub>(OH)], but little or no allanite [CaREE(Fe<sup>2+</sup>)Al<sub>2</sub>Si<sub>3</sub>O<sub>12</sub>(OH)]. The elevated F contents of 0.14 to 0.23 a.p.f.u. indicate that a khristovite component [CaREEMgMn<sup>2+</sup>AlSi<sub>3</sub>O<sub>11</sub>(F,OH)(OH)] may also be present. One problem is that it is difficult to distinguish substitutions of "oxy-allanite" [CaREE(Fe<sup>3+</sup>)Al<sub>2</sub>Si<sub>3</sub>O<sub>13</sub>], its Mn<sup>3+</sup> equivalent [CaREEMn<sup>3+</sup>Al<sub>2</sub>Si<sub>3</sub>O<sub>13</sub>], dollaseite-type [CaREE(R<sup>2+</sup>)<sub>2</sub>(R<sup>3+</sup>)Si<sub>3</sub>O<sub>11</sub>(OH)<sub>2</sub>] or vacancy-linked substitution of REE [Ca<sub>0.5</sub>REE(Al,Fe<sup>3+</sup>)<sub>3</sub>Si<sub>3</sub>O<sub>12</sub>(OH)] with electron microprobe analyses. The chemical analyses suggest a new mineral in the allanite group, but an additional structural refinement as well as more complete chemical analysis concerning determination of the oxidation state of Mn and the OH content are clearly required (ERCIT, 2002).

### References

ERCIT, T. S. (2002): *Can. Mineral.*, 40, 1411-1419.

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