# Swedish ericssonite-group minerals

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The ericssonite group of minerals (EGM; Sokolova et al. 2018) includes ericssonite and “orthoericssonite”, $BaMn_2(Fe^{3+}O)[Si_2O_7](OH)$ (Moore 1971), ferroericssonite, ideally $BaFe^{2+}{}_2Fe^{3+}(Si_2O_7)O(OH)$ (Kampf et al. 2011) and zinkgruvanite $Ba_4Mn^{2+}{}_4Fe^{3+}{}_2(Si_2O_7)_2(SO_4)_2O_2(OH)_2$ (Cámara et al. 2021). These are $Fe^{3+}$ disilicates, which are closely related to seidozerite supergroup minerals (SGM; Sokolova & Cámara, 2017). The later encompasses about 50 mineral species and polytypes, all characterized by TS (titanium silicate) blocks (or HOH blocks) in the structural framework. EGM have also an HOH block as the main structural unit, with $Mn^{2+}$ and $Fe^{2+}$ being the dominant cations in the O (octahedral) sheet of the HOH block and $Fe^{3+}$ being the dominant cation at the [5]-coordinated sites along with $Si_2O_7$ groups of the H (heteropolyhedral) sheets. SGM are divided into four groups based on the Ti content and the topology and stereochemistry of the TS block: in the rinkite, bafertisite, lamprophyllite, and murmanite groups, Ti (+ Nb + Zr + Fe3+ + Mg + Mn) = 1, 2, 3, and 4 apfu, respectively. The presence of HOH blocks in both the EGM and the SGM would lead to place the in the same supergroup. In fact, Moore (1971) described ericssonite and “orthoericssonite” (now ericssonite-2*O*) as “minerals of the lamprophyllite group”. In addition, the two Ti disilicates yoshimuraite, $Ba_4Mn_4Ti_2(Si_2O_7)_2(PO_4)_2O_2(OH)_2$ (a bafertisite-group mineral; McDonald et al 2000) and innelite-1*A* $Ba_4(Na_2M^{2+}Ti)Ti_2(Si_2O_7)_2[(SO_4)(PO_4)]O_3(OH)$ (with $M^{2+}$ = Mn, $Fe^{2+}$, Mg, Ca; a lamprophyllite-group mineral; Sokolova & Cámara, 2017) share in common with zinkgruvanite the insertion of $SO_4/PO_4$ groups between two HOH blocks, i.e. at the I block. Yet, some structural and chemical differences are required to classify them into a separate group: all minerals of the bafertisite and lamprophyllite groups have Ti (+Nb) in the H sheets; in the bafertisite group, the O sheet is composed of Mn or $Fe^{2+}$ octahedra; in the lamprophyllite group, the composition of the O sheet is generally $Na_3Ti$ apfu. In ericssonite, ferroericssonite and zinkgruvanite, the O sheet is composed of Mn or $Fe^{2+}$ octahedra, as in the bafertisite-group minerals, but the topology of the HOH block is the same as in the lamprophyllite-group minerals. Thus, ericssonite and ferroericssonite do not contain the combination of features that is characteristic of either the bafertisite group or the lamprophyllite group. Ericssonite, ericssonite-2*O* and zinkgruvanite are very rare and were first described from Swedish localities (Långban in Filipstad, Värmland County, and Åmmeberg, in the municipality of Askersund, Örebro County). Ericssonite have been also described in the Hijikuzu mine, in the Iwate prefecture (Japan), whereas ferroericssonite have been described so far only in Eastern Fresno County, California (U.S.A). Many of the members of the seidozerite supergroup come from the region of the Kola peninsula. The similarities and differences in topology between these two groups of minerals will be discussed.

## References

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