Alvanite  \((\text{Zn, Ni})\text{Al}_4(\text{VO}_3)_2(\text{OH})_{12}\cdot 2\text{H}_2\text{O}\)

Crystal Data: Monoclinic.  Point Group: 2/m.  In hexagonal platelets, micalike, with forms \{001\}, \{010\}, \{100\}, and \{101\}.  Twinning: Polysynthetic, || \{010\}.

Physical Properties:  Cleavage: Perfect on \{010\}.  Hardness = 3–3.5  D(meas.) = 2.49  D(calc.) = 2.492


Cell Data:  Space Group: \(P2_1/n\).  \(a = 17.808(8)\)  \(b = 5.132(3)\)  \(c = 8.881(4)\)  \(\beta = 92.11(3)^\circ\)  \(Z = 2\)

X-ray Powder Pattern:  Kazakhstan.  4.46 (100), 8.91 (90), 7.85 (80), 5.02 (50), 1.973 (40), 3.287 (35), 2.957 (35)

Chemistry:

\[
\begin{array}{cccc}
\text{Chemical Compound} & \text{Weight Percent (1)} & \text{Weight Percent (2)} & \text{Weight Percent (1)} \\
\text{V}_2\text{O}_5 & 24.2 & 27.5 & \text{NiO} & 2.7 & 4.2 \\
\text{V}_2\text{O}_4 & 3.8 & \text{ZnO} & 0.5 & 7.6 \\
\text{SiO}_2 & 1.8 & \text{MgO} & 0.5 & \\
\text{Al}_2\text{O}_3 & 39.5 & 34.2 & \text{CaO} & 0.5 & \\
\text{Fe}_2\text{O}_3 & \text{trace} & \text{H}_2\text{O}^+ & 25.4 & \\
\text{V}_2\text{O}_3 & 0.0 & \text{H}_2\text{O}^- & 0.5 & \\
\text{FeO} & 0.3 & \text{H}_2\text{O} & \text{[26.2]} & \\
\text{Total} & 99.4 & \text{100.0} & \\
\end{array}
\]

(1) Kazakhstan; several values are averages of two determinations.  (2) Do.; by electron microprobe, \(\text{H}_2\text{O}\) by difference; corresponding to \((\text{Zn}_{0.57}\text{Ni}_{0.34}\text{Fe}_{0.02})^\Sigma_{=0.93}\text{Al}_{1.09}\text{V}_{1.84}\text{O}_{20.50}\text{H}_{17.69}\).

Occurrence: In the oxidation zone of a vanadiferous clay-anthraxolite horizon.

Association: Mica, roscoelite (?).

Distribution: In several mines of the Kurumsak and Balasauskandyk districts, northwestern Kara-Tau Mountains, Kazakhstan.

Name: For ALuminum and VANadium in the composition.

Type Material: Mining Institute, St. Petersburg, 1249/2; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 65614.