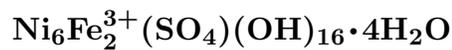


Honessite

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Crystal Data: Hexagonal. *Point Group:* n.d. As “obscurely” fibrous, powdery coatings.**Physical Properties:** Hardness = n.d. D(meas.) = n.d. D(calc.) = n.d.**Optical Properties:** Semitransparent. *Color:* Green or brown.*Optical Class:* [Uniaxial.] $n = 1.615$ $\omega = \text{n.d.}$ $\epsilon = \text{n.d.}$ **Cell Data:** *Space Group:* n.d. $a = 3.083(4)$ $c = 26.71(9)$ $Z = \text{n.d.}$ **X-ray Powder Pattern:** Unst, Scotland.

8.84 (100), 4.43 (40), 2.62 (20), 1.54 (15), 1.52 (15), 2.65 (10), 2.39 (10)

| Chemistry: | (1) | (2) | (3) |
|--------------------------------|------|------|--------|
| SO ₃ | 10.8 | 3.4 | 8.86 |
| Fe ₂ O ₃ | 10.5 | 15.3 | 17.66 |
| FeO | 2.4 | | |
| CoO | 3.6 | | |
| NiO | 42.6 | 37.5 | 49.57 |
| CaO | 2.7 | | |
| H ₂ O ⁺ | 19.7 | | |
| H ₂ O ⁻ | 4.7 | | |
| H ₂ O | | | 23.91 |
| insol. + SiO ₂ | 0.9 | | |
| Total | 97.9 | | 100.00 |

(1) Linden, Iowa, USA. (2) Unst, Scotland; by electron microprobe, (SO₄)²⁻ confirmed by IR, low amount may be due to (CO₃)²⁻ in reevesite admixture; corresponds to Ni_{5.8}Fe_{2.2}(SO₄)_{0.5}(OH)₁₆•4H₂O. (3) Ni₆Fe₂(SO₄)(OH)₁₆•4H₂O.

Occurrence: A rare oxidation product of nickel sulfide minerals.**Association:** Millerite, violarite, bravoite (Linden, Wisconsin, USA); reevesite, hydrohonessite, theophrastite (Unst, Scotland).**Distribution:** In the USA, from the Linden Pb–Zn deposit, near Linden, Iowa Co., and at Hall’s Gap, Lincoln Co., Wisconsin. At the Kamariza mine, Laurium, Greece. In the Hagdale quarry, Unst, Shetland Islands, Scotland.**Name:** Honors Professor Arthur Pharoah Honess (1887–1942), American mineralogist, Pennsylvania State University, State College, Pennsylvania, USA.**Type Material:** National Museum of Natural History, Washington, D.C., USA, 117698.**References:** (1) Heyl, A.V., C. Milton, and J.M. Axelrod (1959) Nickel minerals from near Linden, Iowa County, Wisconsin. *Amer. Mineral.*, 44, 995–1009. (2) Bish, D.L. and A. Livingstone (1981) The crystal chemistry and paragenesis of honessite and hydrohonessite: the sulphate analogues of reevesite. *Mineral. Mag.*, 44, 339–343.