Janggunite $\mathbf{Mn^{4+}_{5-x}(Mn^{2+},Fe^{3+})_{1+x}O_8(OH)_6}$ (x = 0.2)

Crystal Data: Orthorhombic. *Point Group:* n.d. As flaky crystals, to 0.13 mm, elongated ‖ cleavage and flattened on {010}, probable; in radiating groups, dendritic or arborescent masses, and in colloform bands and very fine-grained aggregates.

Physical Properties: *Cleavage:* One direction, perfect. *Tenacity:* Very fragile [*sic*]. Hardness = 2–3 D(meas.) = 3.59 D(calc.) = 3.58

Optical Properties: Opaque. *Color:* Black; grayish white to gray in reflected light. *Streak:* Brownish black to dark brown. *Luster:* Dull.
Optical Class: Biaxial. *Pleochroism:* Distinct; whitish to light gray in oil. *Anisotropism:* Very strong; yellowish brown with bluish tint, to gray. *Bireflectance:* Observed.
R_1–R_2: 13–15

Cell Data: *Space Group:* n.d. $a = 9.324$ $b = 14.05$ $c = 7.956$ Z = 4

X-ray Powder Pattern: Janggun mine, South Korea.
9.34 (s), 7.09 (s), 3.547 (s), 3.101 (s), 4.62 (m), 4.17 (m), 2.469 (m)

Chemistry:

	(1)
MnO_2	74.91
Fe_2O_3	4.19
MnO	11.33
PbO	0.03
H_2O^+	9.46
Total	99.92

(1) Janggun mine, South Korea; Fe and Pb by electron microprobe, total Fe as Fe_2O_3, H_2O as OH verified by IR; corresponds to $Mn^{4+}_{4.86}(Mn^{2+}_{0.90}Fe^{3+}_{0.30})_{\Sigma=1.20}O_{8.09}(OH)_{5.92}$.

Occurrence: Formed at a late stage of oxidation in a cementation zone of a manganese deposit.

Association: Nsutite, todorokite, calcite, rhodochrosite.

Distribution: In the Janggun mine, Bonghwa district, South Korea.

Name: For the Janggun mine, South Korea, its first locality.

Type Material: National Museum of Natural History, Washington, D.C., USA, 143150.

References: (1) Kim, S.J. (1977) Janggunite, a new manganese hydroxide mineral from the Janggun mine, Bonghwa, Korea. Mineral. Mag., 41, 519–523. (2) (1978) Amer. Mineral., 63, 794 (abs. ref. 1).