Oxo-magnesio-hastingsite $NaCa_2(Mg_2Fe^{3+}_3)(Al_2Si_6)O_{22}O_2$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As smoothly rounded megacrysts to 12 cm.

Physical Properties: *Cleavage*: Perfect on {110}, intersecting at ~56º. *Fracture*: Uneven. *Tenacity*: Brittle. *Hardness* = ~ 6 D(meas.) = 3.19(2) D(calc.) = 3.219

Optical Properties: Transparent. *Color*: Brown. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Biaxial (-). $\alpha = 1.706(2)$ $\beta = 1.715(2)$ $\gamma = 1.720(2)$ 2V(meas.) = n.d. 2V(calc.) = 73° *Orientation*: $Y = b$; $Z \wedge c = 8°$. *Dispersion*: Weak, $r > v$. *Pleochroism:* Strong, X = light brown, Y = brown, Z = dark brown.

Cell Data: *Space Group*: *C*2/*m*. $a = 9.8837(3)$ $b = 18.0662(6)$ $c = 5.3107(2)$ $\beta = 105.278(1)°$ $Z = 2$

X-ray Powder Pattern: Deeti volcanic cone, Gregory rift, northern Tanzania.
2.555 (100), 2.708 (97), 2.596 (75), 3.383 (62), 1.5211 (48), 1.5854 (39), 2.162 (36)

Chemistry:

	(1)
SiO_2	41.89
TiO_2	3.96
Al_2O_3	10.75
Fe_2O_3	9.33
FeO	6.09
MnO	0.08
MgO	14.79
CaO	11.76
Na_2O	2.84
K_2O	1.74
H_2O	0.61
Total	99.67

(1) Deeti volcanic cone, Gregory rift, northern Tanzania; average of 17 electron microprobe analyses, Fe^{2+}/Fe^{3+} from Mössbauer spectroscopy; corresponds to $(Na_{0.67}K_{0.33})_{\Sigma=1.00}(Ca_{1.87}Na_{0.14}Mn_{0.01})_{\Sigma=2.02}(Mg_{3.27}Fe^{3+}_{1.25}Ti_{0.44}Al_{0.08})_{\Sigma=5.04}(Al_{1.80}Si_{6.20}O_{22})(O_{1.40}OH_{0.60})_{\Sigma=2.00}$.

Mineral Group: Amphibole supergroup, oxo-amphibole group.

Occurrence: As reacted megacrysts in melilititic tuff derived from a silica-undersaturated alkaline magma.

Association: Diopside, phlogopite.

Distribution: From the Deeti volcanic cone in the Gregory rift, northern Tanzania.

Name: As the *oxygen*- and *magnesium*- dominant analogue of *hastingsite.*

Type Material: Mineralogical Museum, Department of Mineralogy, St. Petersburg State University, St. Petersburg, Russia (sample OL 22, catalog number 1/19465).

References: (1) Zaitsev, A.N., E.Yu. Avdontseva, S.N. Britvin, A. Demény, Z. Homonnay, T.E. Jeffries, J. Keller, V.G. Krivovichev, G. Markl, N.V. Platonova, O.I. Siidra, J. Spratt, and T. Vennemann (2013) Oxo-magnesio-hastingsite, $NaCa_2(Mg_2Fe^{3+}_3)(Al_2Si_6)O_{22}O_2$, a new anhydrous amphibole from the Deeti volcanic cone, Gregory rift, northern Tanzania. Mineral. Mag., 77(6), 2773-2792. (2) (2015) Amer. Mineral., 100, 2013 (abs. ref. 1).