Wonesite  \( (\text{Na}, \text{K})_{0.5}^{\text{c}} \text{Mg, Fe, Al})_{3}^{\text{c}} \text{Si, Al})_{4}^{\text{c}} \text{O}_{10}^{\text{c}} (\text{OH, F})_{2}^{\text{c}} \)

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**Crystal Data:**  Monoclinic.  *Point Group:* 2/\(m\).  As irregularly shaped flakes, to about 0.5 mm; exsolves epitaxially-intergrown sodium-rich biotite and talc.  *Twinning:* Twin axis [310] and composition plane \{001\}, common.


\( \text{D(meas.) = n.d. D(calc.) = [2.89]} \)

**Optical Properties:**  Transparent.  *Color:* Pale to dark brown; in thin section, light to dark brown.

*Optical Class:*  Biaxial (-).  *Pleochroism:* Strong; \( X = \text{pale brown}; Y = Z = \text{dark brown.} \)

\( \alpha = 1.544(4) \quad \beta = 1.608(2) \quad \gamma = 1.608(2) \quad 2\text{V(meas.)} = 0^\circ\text{,}5^\circ \)

**Cell Data:**  *Space Group:* \( C2/m \).  \( a = 5.312(3) \quad b = 9.163(5) \quad c = 9.825(6) \quad \beta = 103.18(6)^\circ \quad Z = 2 \)

**X-ray Powder Pattern:**  n.d.

**Chemistry:**

| \( \text{SiO}_2 \) | 48.53 | CaO | 0.04 |
| \( \text{TiO}_2 \) | 0.77 | \( \text{Na}_2\text{O} \) | 3.07 |
| \( \text{Al}_2\text{O}_3 \) | 13.73 | \( \text{K}_2\text{O} \) | 0.85 |
| \( \text{Cr}_2\text{O}_3 \) | 0.08 | F | 0.15 |
| \( \text{FeO} \) | 7.02 | \( \text{H}_2\text{O} \) | [4.31] |
| \( \text{MnO} \) | 0.04 | \( -\text{O} = \text{F}_2 \) | [0.06] |
| \( \text{MgO} \) | 22.11 | Total | [100.70] |

(1) Mt. Cube quadrangle, Vermont, USA; by electron microprobe, \( \text{H}_2\text{O} \) content is ideal for phlogopite; corresponds to \( (\text{Na}_{0.40}\text{K}_{0.07})_{\Sigma=0.47}\text{Mg}_{2.20}\text{Fe}_{0.40}\text{Al}_{0.31}\text{Ti}_{0.04})_{\Sigma=2.95} \) \( (\text{Si}_{3.24}\text{Al}_{0.76})_{\Sigma=4.00}\text{O}_{10}^{\text{c}}(\text{OH, F})_{2}^{\text{c}} \).

**Mineral Group:**  Mica group.

**Occurrence:**  In metavolcanics with high Mg:Fe, moderate sodium, and very little calcium, metamorphosed at an estimated 535 °C.

**Association:**  Phlogopite, talc, anthophyllite, cordierite, gedrite, chlorite, quartz.

**Distribution:**  From Norwich, Windsor Co., Vermont, and elsewhere in the Post Pond Volcanics, southwest corner of the Mt. Cube quadrangle, New Hampshire and Vermont, USA.

**Name:**  To honor petrologist David R. Wones (1932–1984), Professor of Geology, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, USA.


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