Fontarnauite  $(\text{Na, K})_2(\text{Sr, Ca})(\text{SO}_4)[\text{B}_5\text{O}_8(\text{OH})](\text{H}_2\text{O})_2$

Crystal Data: Monoclinic.  *Point Group:* $2/m$.  As prismatic pseudohexagonal crystals, clusters of crystals to 5 mm, or as branching aggregates.

Hardness = 2.5-3  $D_{\text{meas.}} = 2.37$  $D_{\text{calc.}} = 2.53$

*Luster:* Pearly.

Optical Class: Biaxial ($\times$).  $\alpha = 1.517(2)$  $\beta = 1.539(2)$  $\gamma = 1.543(2)$  
$2V_{\text{meas.}} = 46(1)^{\circ}$  $2V_{\text{calc.}} = 46^{\circ}$  
*Dispersion:* $r > \nu$, medium to weak.  
*Orientation:* $X \parallel a = 95.0^{\circ}$ ($\beta$ obtuse); $Y \parallel b$, $Z \parallel c = 81.9^{\circ}$ ($\beta$ acute).

Cell Data:  *Space Group:* $P2_1/c$.  
$a = 6.458(2)$  $b = 22.299(7)$  $c = 8.571(2)$  
$\beta = 103.047(13)^{\circ}$  
$Z = 4$

X-ray Powder Pattern: Emet basin, near Doğanlar, Kütahya Province, Western Anatolia, Turkey.  
11.150 (100), 3.339 (20), 3.199 (10), 3.046 (10), 2.750 (10), 3.395 (8), 2.400 (8)

Chemistry:  

<table>
<thead>
<tr>
<th>Substance</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{B}_2\text{O}_3$</td>
<td>[30.77]</td>
<td>37.45</td>
</tr>
<tr>
<td>$\text{Na}_2\text{O}$</td>
<td>12.65</td>
<td>13.14</td>
</tr>
<tr>
<td>$\text{K}_2\text{O}$</td>
<td>1.70</td>
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<tr>
<td>$\text{CaO}$</td>
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<tr>
<td>SrO</td>
<td>18.98</td>
<td>22.30</td>
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<tr>
<td>SO$_3$</td>
<td>17.75</td>
<td>17.23</td>
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<tr>
<td>H$_2$O</td>
<td>10.01</td>
<td>9.69</td>
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<tr>
<td>Total</td>
<td>102.01</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1)  Emet basin, near Doğanlar, Kütahya Province, Western Anatolia, Turkey; average of 43 electron microprobe analyses supplemented by TG and DTA analysis, FTIR and Raman spectroscopy, H$_2$O and B$_2$O$_3$ calculated; corresponds to $(\text{Na}_{1.84}\text{K}_{0.16})\Sigma=2.00(\text{Sr}_{0.82}\text{Ca}_{0.18})\Sigma=1.00\text{S}_{1.00}\text{B}_{5}\text{H}_5\text{O}_{15}$.  
(2)  $\text{Na}_2\text{Sr}(\text{SO}_4)[\text{B}_5\text{O}_8(\text{OH})](\text{H}_2\text{O})_2$.

Occurrence: An early diagenetic phase in borate-bearing marls and tuffs.

Association: Probertite, glauberite, celestine; or with halite, kaliborite replacing probertite, kalistronite replacing fontarnauite in pseudomorphs after glauberite.

Distribution: From the Kütahya-Emet 2 and 188 (Doğanlar) boreholes, Emet (or Emet-Hisarcık) basin, near Doğanlar, Kütahya Province, Western Anatolia, Turkey.

Name: Honors Dr. Ramon Fontarnau i Griera, in recognition of his efforts to promote the development of scientific facilities focused on mineral characterization.

Type Material: Royal Ontario Museum, Toronto, Canada (M56745).