

Feldspars and feldspathoids IV: The boron-bearing feldspars

As we noted in Part I of this series, B^{3+} as well as Al^{3+} can substitute for Si^{4+} in tetrahedral sites. Thus there are B-bearing

analogues of the two plagioclase end-members, with reedmergnerite analogous to albite and danburite analogous to anorthite.

Let's begin with the chemical formula for quartz, the most familiar silica mineral.

Let's quadruple that formula.



B^{3+} is an analog of Al^{3+} but is much less abundant than Al^{3+} . It substitutes for Si^{4+} to form rare feldspars.

$NaBSi_3O_8$
Reedmergnerite
The B-feldspar chemical analog of albite



The more "normal" Al-feldspars on this side of the diagram were the subjects of Parts II and III of this series and reappear in Part V, the summary of the series thus far.

Li^+	Be^{2+}	B^{3+}	C^{4+}
Na^+	Mg^{2+}	Al^{3+}	Si^{4+}
K^+	Ca^{2+}	Sc^{3+}	Ti^{4+}
Rb^+	Sr^{2+}		
Cs^+	Ba^{2+}		



The geometry of the tectosilicate structure will allow a second iteration of this substitution, to give the unbalanced formula at right.



$CaB_2Si_2O_8$
Danburite

The B-feldspar chemical analog of anorthite