

# SYNTHESIS AND INVESTIGATION OF F- SODALITE AT 400–750°C AND $P_{H_2O}$ 1–2 KBAR

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Key words: *Fluorine-bearing sodalite, mineral synthesis, unit cell parameters*

Fluorine- bearing sodalite was synthesized from the mixtures of oxides and fluorides and from the gel of nepheline composition at temperature 400-750°C and water pressure 1-2 kbar. The X-ray and microprobe investigation of synthetic fluorine- sodalite was conducted. It was shown that sodalite composition is corresponded to formulae:  $Na_8Al_6Si_6O_{24}F_2$ . The cell parameters of synthetic fluorine-sodalites are following:  $a = 9.040(4)$  [Å];  $V = 737.9(9)$  [Å]<sup>3</sup>. The comparison with cell parameters of another sodalites show that cell parameters of fluorine- sodalites are deflected from general dependence of cell volumes on anion radius:

$$V = 651.4 + 32.035 \cdot (R_{an}, \text{Å}),$$

where  $V$  – cell volume of sodalites, [Å]<sup>3</sup>;  $R_{an}$  – anion radius [Å].

At 400 and 650°C F- sodalite synthesis was carried out from gel mixtures of nepheline composition in the interval of NaF concentration in fluid from 5 to 60 wt.% at different ratio nepheline / sodium fluoride. It was discovered that sodalite is synthesized from low concentration of NaF in fluid (such as 5 wt%) at 650°C. The degree of nepheline conversion to sodalite (the mass % of sodalite) increases accordingly to increasing of NaF containing in starting materials. At 650°C and  $P=2$ kbar the chlorine and fluorine partitioning between sodalite and fluid was studied.

Preliminary data allow to conclude, that fluorine distributed into fluid phase relatively to sodalite, distribution coefficients are  $K > 500$ .

*This work is supported by RFBR grants №06-05-64904, 07-05-00081*

*Electronic Scientific Information Journal "Vestnik Otdelenia nauk o Zemle RAN" № 1(27) 2009*

*ISSN 1819 – 6586*

*Informational Bulletin of the Annual Seminar of Experimental Mineralogy, Petrology and Geochemistry – 2009*

*URL: [http://www.scgis.ru/russian/cp1251/h\\_dgggms/1-2009/informbul-1\\_2009/mineral-11e.pdf](http://www.scgis.ru/russian/cp1251/h_dgggms/1-2009/informbul-1_2009/mineral-11e.pdf)*

*Published on July, 1, 2009*

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