

#1. a) $S_i = \underline{6.025} = Z$

b). $Y = 4.00 : Al = 3.884$

$Cr = 0.000$

$Ti = 0.000$

$\underline{3.884}$

$\therefore Fe^{3+} = 0.116$

} made up to equal 4.000.

$(\Rightarrow Fe^{2+} = 1.409 - 0.116)$
 $= 1.293.$

c). $X : Fe^{2+} = 1.293$

$Cu = 3.444$

$Mn = 1.055$

$Mg = 0.215$

$\underline{6.007}$

#2. a) $Z : S_i = 6.025$

b) $Y ; (4.000) : Al = 3.876$

$Cr = 0.000$

$Ti = 0.000$

$\underline{3.876}$

$\therefore Fe^{3+} = 0.124$

} made up to equal 4.000

$(\Rightarrow Fe^{2+} = 1.363 - 0.124)$
 $= 1.239.$

c). $X : Fe^{2+} = 1.239$

$Cu = 3.604$

$Mn = 0.962$

$Mg = 0.206$

$\underline{6.011}$

GRAIN #1 : Fe decrease

Cu increase

Mn decrease

Mg decrease

} core to rein.

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3) a) Z: Si = 6.017

b)

Y (4,000): Al = 3.900
Cr = 0.000
Ti = 0.000

$\therefore Fe^{3+} = 0.100 \cdot (\Rightarrow Fe^{2+} = 1.366 - 0.100)$
 $= 1.266$

c) X: Fe²⁺ = 1.266
Cu = 3.540
Mn = 1.001
Mg = 0.208

6.015

4) a) Z: Si = 5.997
- add 0.003 Al to make up to 6.000

b) Y (4,000): Al = 3.938 - 0.003 = 3.935
~~Fe = 2.815~~
Cr = 0.000
Ti = 0.000

3.935

$\therefore Fe^{3+} = 0.065 (\Rightarrow Fe^{2+} = 1.819 - 0.065)$
 $= 1.754$

c) X = Fe²⁺ = 1.754
Cu = 2.815
Mn = 1.196
Mg = 0.268

6.033

GRAIN #2: Fe.

$$\frac{3}{5) \quad a) Z = \text{Si} = 6.002$$

$$b) Y (4.000) : \begin{array}{l} Al = 3.891 \\ Cr = 0.001 \\ Ti = 0.000 \\ \hline \text{~~3.98~~} \\ 3.892 \end{array}$$

$$\therefore Fe^{3+} = 0.108 \quad (\Rightarrow Fe^{2+} = 1.451 - 0.108) \\ = 1.343$$

$$c) X : \begin{array}{l} Fe^{2+} = 1.343 \\ Ca = 3.478 \\ Mn = 1.066 \\ Mg = 0.164 \\ \hline = 6.051 \end{array}$$

$$c) a) Z : \begin{array}{l} Si = 5.999 \quad (\therefore \text{to make up to } 6.000) \\ Al = 0.001 \quad (\text{add Al}) \end{array}$$

$$b) Y : \begin{array}{l} Al = 3.926 - 0.001 = 3.925 \\ Cr = 0.000 \\ Ti = 0.000 \\ \hline 3.925 \end{array}$$

$$\therefore Fe^{3+} = 0.075 \quad (\Rightarrow Fe^{2+} = 1.453 - 0.075) \\ = 1.378.$$

$$c) X : \begin{array}{l} Fe^{2+} = 1.378 \\ Ca = 3.393 \\ Mn = 1.088 \\ Mg = 0.178 \\ \hline = 6.037 \end{array}$$

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7) a) Z : Si = 6.016

b) Y : Al = 3.914
Cr = 0.000
Ti = 0.000
3.914

∴ Fe³⁺ = 0.086 (⇒ Fe²⁺ = 1.560 - 0.086)
= 1.474.

c) X : Fe²⁺ = 1.474
Ca = 3.236
Mn = 1.114
Mg = 0.185
= 6.009.

8).