— Mc Claims — (Anomaly "A" -1200 γ).

825324

Given: V_{max} = 1200 γ - peak value on profile
t = thickness = 30' - from profile (see profile).

Calculate percentage pyrrhotite and percentage magnetite required to cause such an anomaly.

a) Equation used.

$$V_{max} = 2 \times 10^5 \, I \times t$$

Substituting:

$$1200\gamma = 2 \times 10^5 \times I \times 30$$

$$I = \frac{1200}{60 \times 10^5} = 2.0 \times 10^{-4}$$

Susceptibility of magnetite = 0.5

given: $I = kH$

$$2.0 \times 10^{-4} = 0.5 \times \left(\frac{y}{100}\right) \times 0.6$$

(y = % magnetite; 0.6 = H for magnetite)

$$\frac{y}{100} = \frac{2.0 \times 10^{-4}}{3.0 \times 10^{-1}} = 0.66 \times 10^{-3}$$

$$\therefore y = 100 \times 0.66 \times 10^{-3}$$

$$= 6.6 \times 10^{-2}$$

$$= \underline{0.066 \text{ \% magnetite.}}$$

b) Calculation for pyrrhotite.

$V_{max} = 2 \times 10^5 \, I \, t$

$1200 = 2 \times 10^5 \, I \times 30$

$I = 2.0 \times 10^{-4}$

$I = kH$ $\quad k = 0.008$ for pyrrhotite (varies).

$H = 0.5$

susceptibility of pyrrhotite. % pyrrhotite.

$\therefore 2.0 \times 10^{-4} = 8.0 \times 10^{-3} \times 5.0 \times 10^{-1} \times \left(\frac{y}{100}\right)$

$\frac{y}{100} = \frac{2.0 \times 10^{-4}}{4.0 \times 10^{-3}} = 0.5 \times 10^{-1}$

$\therefore$ % pyrrhotite $= y = 0.5 \times 10^{-1} \times 100 = 5.0 \times 10^{0} = \underline{\underline{5\%}}$

Therefore anomaly "A" in order to give a 1200γ anomaly must contain either 0.066% magnetite or 5.0% pyrrhotite.

Since this anomaly has a coincident E.M anomaly (-14°) pyrrhotite would be the most likely cause of the anomaly.

Anomaly B - 1700 γ

$t = 30'$ = width

$$V_{max} = 2 \times 10^5 \times I \times 30$$

$$I = \frac{1700}{2 \times 10^5 \times 30} = 2.84 \times 10^{-4}$$

a) for magnetite

$$I = kH = 0.5 \times \left(\frac{y}{100}\right) \times 0.6$$

$$\frac{y}{100} = \frac{2.84 \times 10^{-4}}{3.0 \times 10^{-1}} = 0.944 \times 10^{-3}$$

∴ % magnetite = $y = 100 \times 0.994 \times 10^{-3}$ = 0.0994 %

b) for pyrrhotite

$$I = kH = 8.0 \times 10^{-3} \times \left(\frac{y}{100}\right) \times 0.5$$

∴ % pyrrhotite = $y = 100 \times \frac{2.84 \times 10^{-4}}{4.0 \times 10^{-3}}$ = 7.1 %

Anomaly C $V_{max} = 1100\,\gamma$
$t = 5'$ = width

$$V_{max} = 1100 = 2\times10^{5} \times I \times 5$$
$$I = \frac{1100}{10\times10^{5}} = 11\times10^{-4}$$

For magnetite.
$$I = kH = 0.5 \times \left(\frac{y}{100}\right) \times 0.6$$
$$\frac{y}{100} = \frac{11\times10^{-4}}{3\times10^{-1}} = 3.66\times10^{-3}$$
$$\therefore\ y = 1\times10^{2} \times 3.66\times10^{-3} = 3.66\times10^{-1}$$

% magnetite = 0.366 %

For pyrrhotite
$$I = kH = 0.008 \times \left(\frac{y}{100}\right) \times 0.5$$
$$y = 100 \times \frac{11.0\times10^{-4}}{4\times10^{-3}} = 27.5\%$$

$\therefore$ % pyrrhotite = 27.5%

Anomaly E. $V_{max} = 1996\ \gamma$
$t = 15' = \text{width}$

$$V_{max} = 1996 = 2\times10^{5} \times I \times 15$$

$$I = \frac{1996}{30\times10^{5}} = 6.65\times10^{-4}$$

For magnetite

$$I = kH = 0.5 \times \left(\frac{y}{100}\right) \times 0.6$$

$$\frac{y}{100} = \frac{6.65\times10^{-4}}{3.0\times10^{-1}} = 2.21\times10^{-3}$$

$\therefore$ % magnetite $= y = 2.21\times10^{-3} \times 1.0\times10^{2} =$ 0.221 %

For pyrrhotite

$$I = kH = 8\times10^{-3} \times \left(\frac{y}{100}\right) \times 0.5$$

$$y = 100 \times \frac{6.65\times10^{-4}}{4.0\times10^{-3}} = 1.665\times10^{1} = 16.65\%$$

Anomaly D $V_{max} = 1600\gamma$
$t = 15'$

$$V_{max} = 1600 = 2\times10^{5} \times I \times 15$$

$$\therefore I = \frac{1600}{30\times10^{5}} = 5.33\times10^{-4}$$

For magnetite

$$I = kH = 0.5 \times \left(\frac{y}{100}\right) \times 0.6$$

$$\frac{y}{100} = \frac{5.33\times10^{-4}}{3.0\times10^{-1}} = 1.775\times10^{-3}$$

$$\therefore \%\ \text{magnetite} = 100 \times 1.775\times10^{-3} = \underline{0.1775\ \%}$$

For pyrrhotite.

$$I = kH = 8\times10^{-3} \times \left(\frac{y}{100}\right) \times 0.5$$

$$y = 100 \times \frac{5.33\times10^{-4}}{4\times10^{-3}} = 1.33\times10^{1} = \underline{13.3\ \%}$$