

Theoretical Densities.

MASSIVE SULPHIDE.

$$SG_R = \frac{\%Fe}{\%Fe_{in\ py}} * density_{py} + \frac{\%Zn}{\%Zn_{in\ ZnS}} * SG_{ZnS} + \frac{\%Pb}{\%Pb_{in\ PbS}} * SG_{PbS}$$

$$QUARTZITE = \%SiO_2 * SG_{SiO_2} + \frac{\%Fe}{\%Fe_{in\ FeS}} * SG_{FeS} + \frac{\%Zn}{\%Zn_{in\ ZnS}} * SG_{ZnS} + \frac{\%Pb}{\%Pb_{in\ PbS}} * SG_{PbS}$$

GRAPHIC QUARTZITE assume ratios $SiO_2 : C$

and combine into one specific gravity.

then as above :- NB.

PYRRHOTITE is lighter than pyrite!!

Break up of Fe% between pyrite & pyrrhotite.

Next estimate relative amounts.

$\%Fe_S$

$\%PY * \%Fe_{in\ PY} *$
IN SAMPLE

$\%PYRRH * \%Fe_{in\ PO} *$
IN SAMPLE

$$SG_{PY} * \%PY + SG_{PO} * \%PO$$

$\%Fe_{in\ FeS}$

(volumetric ratio) $p_T - p^0$

$$\frac{\% \text{Fe in FeS}}{c} * \frac{\% \text{FeS}}{\text{wt (wt)}} + \frac{\% \text{Fe in PO}}{c} * \frac{\% \text{PO}}{\text{wt (wt)}} = \% \text{Fe.}$$

by weight.

% volume / to weight %.

~~wt SG~~ gwt/cc wt.

% vol \longrightarrow % wt

$$\frac{\% \text{vol} * \text{SG}}{\text{total SG}} = \% \text{wt.}$$

$$\frac{\% \text{Fe in FeS} * \% \text{wt FeS} * \text{SG}_{\text{FeS}}}{\text{SG}_{\text{SAMPLE}}} + \frac{\% \text{Fe in PO} * \% \text{wt PO} * \text{SG}_{\text{PO}}}{\text{SG}_{\text{SAMPLE}}}$$

$$+ \frac{\% \text{Zn in ZnS} * \% \text{wt ZnS} * \text{SG}_{\text{ZnS}}}{\text{SG}_{\text{SAMPLE}}} + \% \text{P}$$

$\frac{1}{\text{SG}_{\text{SAMPLE}}}$