and insoluble $Fe(OH)_2$ at various pH levels is shown in Figure 1, where percent composition is plotted versus pH. Figure 1 was constructed according to methods described by Sillin.(22) The factor limiting concentration of Fe^{+2} in solution is the equilibrium concentration at any pH. Table 1 gives the distribution of the various forms in which Fe^{+2} occurs at various pH levels.

TABLE 1. EQUILIBRIUM COMPOSITION FOR THE SYSTEM Fe^{+2} - $Fe(OH)_2$ AT VARIOUS pH VALUES, EXPRESSED AS FRACTION OF TOTAL Fe^{+2} PRESENT

pH	Fe^{+2}	$\frac{[Fe(OH)_2]_s}{1}$	$\frac{[Fe(OH)_2]_s}{2}$	$[Fe(OH)_2]_a$	$[FeOH^+]$
5.0	.999	.000005	.000005	.020 x 10^{-8}	.000002
6.0	.903	.047	.047	.000002	.002
6.5	.485	.253	.255	.00002	.0068
7.0	.087	.454	.457	.00002	.0019
7.5	.0094	.493	.496	.00002	.0013
8.0	.00095	.496	.499	.00002	.0002
9.0	.00001	.498	.501	.00002	.00002

s = solid
1 = $FeOH^+ + OH^- \rightarrow Fe(OH)_2$
2 = $Fe^{+2} + 2\ OH \rightarrow Fe(OH)_2$
a = aqueous

From these data it appears that about 50 percent of the $Fe(OH)_2$ formed at any pH is due to the intermediate reaction $FeOH^+ + OH^-$ while the remaining 50 percent is formed directly from $Fe^{+2} + 2\ OH^-$.

Fe^{+3} is also found in mine water and as described earlier, is soluble only under special conditions. Like Fe^{+2}, the solubility can be determined from a consideration of the various equilibria involved. Figure 2 is a distribution diagram