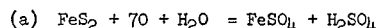
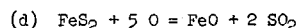
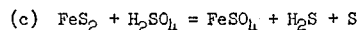
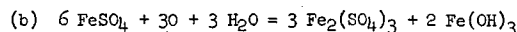


present. It is believed, however, that chemical oxidation is not the only means whereby acid forming constituents are produced from pyrite. Electrochemical and biological processes also have been cited as pyrite oxidation reactions.

1. Chemical oxidation of pyrite:- The following reactions describe the chemical oxidation of pyrite in the presence of water:



This reaction has been reported by many workers. (4, 5, 6) In addition to (a) several subsequent reactions (7) may occur. These can be described as follows:



Garrels and Thompson, 1960 (8) studied the oxidation of pyrite by iron sulfate and this led them to the conclusion that "pyrite is apparently oxidized by ferric ion to ferrous ion, hydrogen ion, and sulfate ion. The first step in the oxidation process, however, may be to produce molecular sulfur." They represented the overall reaction as $8 \text{H}_2\text{O} + \text{FeS}_2 + 14 \text{Fe}^{+3} \rightarrow 15 \text{Fe}^{+2} + 2 \text{SO}_4^{+2} + 16 \text{H}^+$.

The exact mechanism of the reaction is still in doubt. The various interactions between pyrite, oxygen, water, and the various oxidation products have not been studied in detail. Moulton, 1957 (9) in a review of the mine drainage problem in Ohio, says that "many fundamental questions which are directly pertinent to a competent solution of the problem remain unanswered."

2. Electrochemical oxidation of pyrite:- Berzelius, 1821 (10) speculated that "it seems highly probable that the falling asunder of ordinary pyrites arises from the electrochemical action of electronegative bisulphuret which is here and there mixed with it in small particles."