(H_2C0_2) or oxalic acid ($H_2C_20_4$) with concentrated sulfuric acid. The sulfuric acid abstracts hydrogen and oxygen, forming water. In the case of oxalic acid carbon dioxide also is formed, which may be dissolved in a solution of sodium hydroxid.e:.

$$HzCO_z \sim CO\,t + HzO,$$

Formic acid

$$H_zC_z0_4 \sim CO\,t + CO_z\,t + H_20.$$

Oxalic acid

I69. Properties.--':'Carbon monoxide is a colorless gas which is virtually odorless' and tasteless. Its specific gravity is slightly less than that of air, and it is only slightly soluble in water. The gas may be liquefied more readily than hydrogen, but less readily than carbon dioxide.

Carbon monoxide is an *unsaturated compound, ·i.e.,* it has a tendency to combine with such substances as oxygen and chlorine in order thaJ carbon may have its maximum valence of 4. The gas burns with a bluish flame, producing much heat:

$$2CO + Oz \sim 2C0_2 + 2\text{ X }68{,}000\text{ cal .}$$

. Carbon monoxide is a good *reducing agent,* and plays an important role in the blast-furnace, for at high temperatures it has great affinity for oxygen and therefore robs ores of this element (547). Hematite, or ferric oxide, is our most important iron ore.

$$Fe_z03 + 3CO \sim 2Fe + 3C02'$$

Hematite

'When a mh:ture of carbon monoxide and chlorine is e.'q)osed to sunlight, the ga..<es unite to form *Phosgene* (Gk., *gellerated by light,)* or *carbollyl chloride* (COCk) :

$$CO + Ck \sim COCl\,\bullet.$$

It is manufactured by passing CO and Ck over porous charcoal (catalyst). Phosgene is a colorless liquid with a low boiling point (SO), and its vapor is very poisonous; it was used very e .. "tensively during the Great War. When phosgene comes in contact with water it is decomposed:

$$\begin{matrix}HO\ Cl \\ HO\ H\ Cl\ /\end{matrix} + \text{""}C = 0 \rightarrow 2HCI + \begin{matrix}HO \\ HO/\end{matrix}\text{'"-C = O.}$$

Carbonic acid

When it is inspired, therefore, hydrochloric acid is formed in the lungs.

170. Physiological Action.-Carbon monoxide is a very poisonous gas; it unites with the hemoglobin of the blood corpuscles to