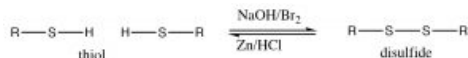
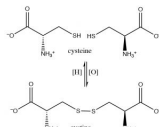


## 6.5: Oxidation of Thiols

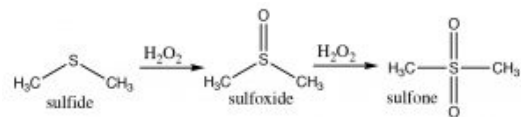
In alcohols, oxidation generally occurs at the carbon bonded to oxygen. In contrast, with thiols the oxidation site is often at the sulfur. For example, many oxidizing agents (even molecular oxygen in air) oxidize thiols to disulfides. The reverse reaction is also readily accomplished using a reducing agent such as  $\text{Zn}/\text{HCl}$ . The disulfide bond is relatively weak, that is, requires less energy to break (about half the strength of a typical  $\text{C}-\text{C}$  or  $\text{C}-\text{H}$  bond).<sup>[6]</sup>



In fact, the amino acids cysteine and diamino acid cystine are readily interconverted in biological systems (usually through the  $\text{NADH}/\text{NAD}$  oxidation/reduction system; see below). These disulfide crosslinks between cysteine moieties in polypeptides and proteins often serve to stabilize the 3D structure of proteins.



Sulfides ( $\text{R}-\text{S}-\text{R}$ ) are also susceptible to oxidation, which can lead to the formation of a sulfoxide, which can be further oxidized to form a sulfone.



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