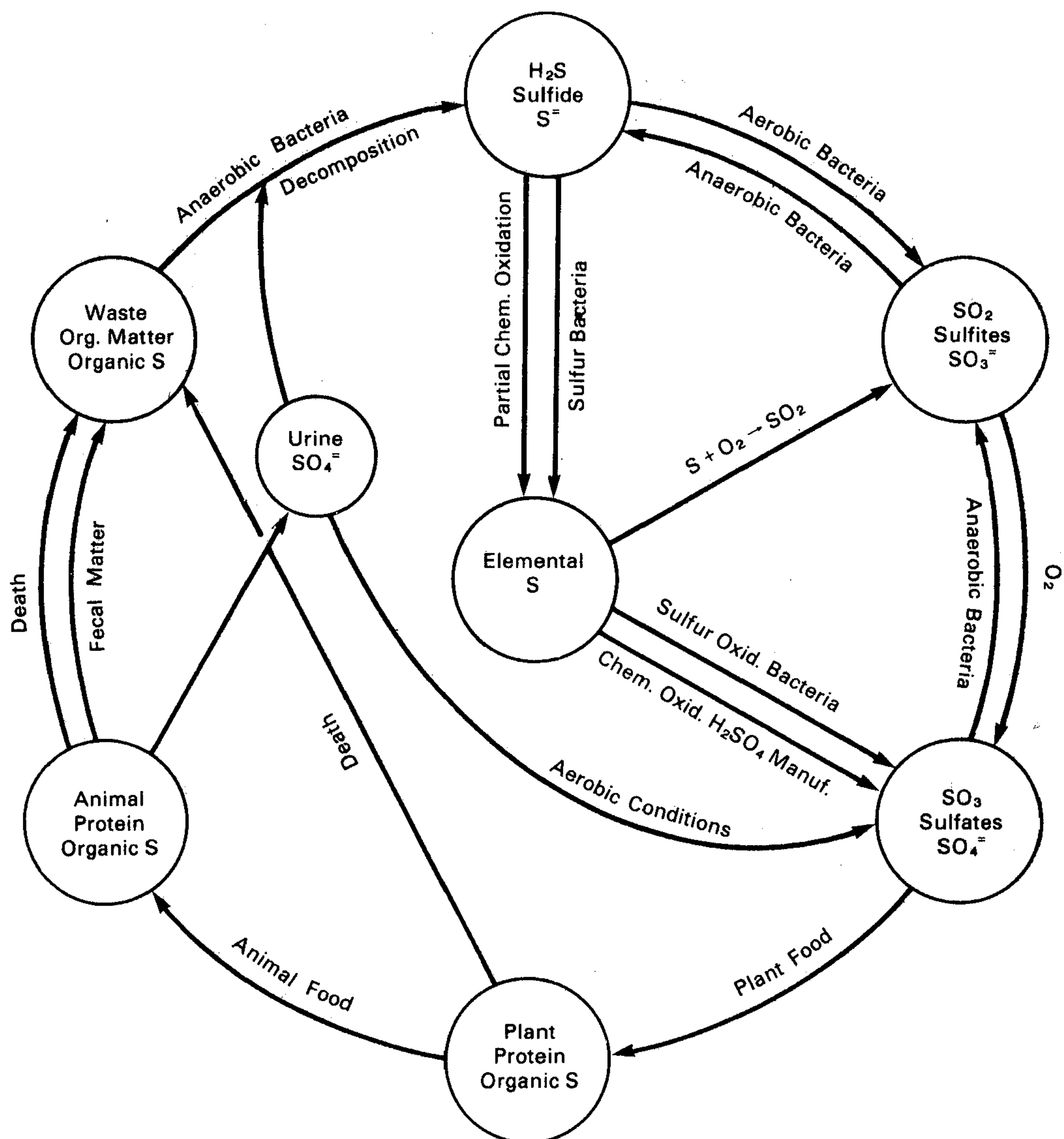


Figure 2-1. The sulfur cycle (5).



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anaerobic bacteria, can use only combined forms of oxygen (NO_3^- , SO_4^{2-}), while a large number of others are facultative and can use either free or combined oxygen as a hydrogen acceptor.

In the absence of dissolved oxygen (DO) and nitrates, sulfates serve as the hydrogen acceptor for biochemical oxidation by obligate anaerobic bacteria as expressed in reaction 2-1. The most important sulfate-reducing organism is the species *Desulfovibrio*. These bacteria are found both in the digestive tract of man and animals and in mud containing organic matter, and are normally present in domestic wastewater. The source of organic matter for this

microorganism is quite restricted, and ammonia is the sole source of nitrogen.

2.2.2.2 Organic Compound Reductions

Proteins consist of amino acids, some of which contain sulfur. H_2S can be produced by the anaerobic decomposition of amino acids such as cysteine, cystine and methionine. This fermentation process is carried out by many species of proteolytic bacteria, including *Veillonella*, *Clostridia*, and *Proteus*(7). Although organic decomposition can contribute to H_2S production, sulfate reduction is the most significant mechanism for H_2S generation in wastewater.