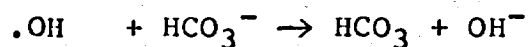
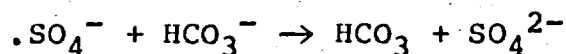


from the qualitative work of Bracewell and Gall that these catalytic reactions are unimportant.

Barrie and Georgii (1976) have demonstrated qualitatively that Mn(II) and Fe(III) exhibit a synergistic rate for the catalysis of S(IV) oxidation. Their rate expression cannot be considered to be reliable since they used a supported droplet.

In summary, our status of knowledge of the homogeneous metal ion catalysis systems is:

1. S(IV) oxidation rates are significantly increased by Mn(II) and Fe(III). There is serious doubt regarding the rate expression for Mn(II), but the agreement among independent studies is much better for Fe(III).
2. These systems are presently inadequately characterized: Cu(II), V(V), V(IV), Ni(II), Zn(II), and Pb(II).
3. There are no quantitative studies of metal ion-metal ion synergism.
4. The ability of atmospheric organic compounds to inhibit the catalysis is unknown.
5. All studies have been performed in the absence of HCO_3^- ; however, the reactions



may be important. It is possible that such reactions may occur, and if so, they would prevent the oxidation radical chain from establishing since HCO_3 is not a powerful oxidizer (Hoigne and Bader, 1978).