The soot exposed to humidified air produced more SO_4^{2-} than that exposed only to dry air. They also observed for downtown Los Angeles a strong correlation between the concentration of ambient carbon and SO_4^{2-} formation. (See discussion in Section 2.3.4.3.)

Tartarelli et al. (1978) studied the interaction of SO_2 with carbonaceous particles collected from the flue ducts of oil burning power stations. They concluded that the amount of adsorption is increased by the presence of oxygen and water in the gas stream. Reaction rates were not determined in this study.

Liberti et al. (1978) studied the adsorption and oxidation of SO_2 on various particles, including soot from an oil furnace and various atmospheric particulate samples. They concluded that the main interaction between the SO_2 and particulate matter is adsorption, with most catalytic reactions occurring at high temperatures, near the combustion source. Their experiments with atmospheric particulate samples lead them to the conclusion that any heterogeneous nonphotochemical sulfate formation is strongly dependent on the reactivity of the particle surface, and hence the history (aged, freshly emitted), of the aerosol.

In summary, the status of our knowledge of surface reactions is:

1. The reactions are capacity-limited. Those that involve catalysis in liquid films can be extended by the absorption of NH_3.