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## KINETICS OF CLOUD DROPLET ACTIVATION

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Activation of an aerosol particle into a cloud droplet occurs when the environmental supersaturation exceeds the critical supersaturation of the particle. This process is controlled by the rate of generation of potential supersaturation, the net rate of mass transport of water vapor to the ensemble of particles, the thermodynamic driving force for condensation, latent heat release, and uptake of soluble gases. During cloud formation the environmental supersaturation exhibits a transient maximum triggered by initial adiabatic cooling and quenched by condensation of water vapor onto the activated cloud droplets. Results are presented from a zero-dimensional reference model that serves as a testbed for parametrizations of these processes and their dependence on controlling variables--number concentration and size distribution of pre-existing aerosol, rate of generation of potential supersaturation, and concentration of trace soluble and reactive gases.