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Atmospheric Processes Involving Condensed Water

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Various mechanisms of formation and growth of water microdrops in the atmosphere include attachment of water molecules to them, coagulation and coalescence processes, and growth of drops during the rain caused by the gravitation. Condensed water cannot be formed under the conditions of standard atmosphere, it results from mixing of humid streams with cold air. Atmospheric water microdrops form the clouds, and their contribution to the atmospheric radiative flux toward the Earth is about 30%. The Mie theory for scattering of infrared radiation on liquid water droplets is represented that uses the measured optical parameters for liquid water. Then, basing on the energetic balance of the Earth and its atmosphere, it is possible to determine the relative mass of condensed water, which is of the order of 1% of the total mass of atmospheric water and is several times less than the analysis of atmospheric electricity suggests.

Keywords: water condensation, growth of water drops, mechanisms of water nucleation, Mie theory for water, absorption by water drops.