

Abstract Submitted
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Synthesis of water ice particles in a rf plasma chamber with the cooled electrodes SATOSHI SHIMIZU, TETSUJI SHIMIZU, HERMANN ROTHERMEL, BORIS KLUMOV, OVE HAVNES, HUBERTUS THOMAS, GREGOR MORFILL — Water ice particles are present in a long row of terrestrial and space situations. The processes which lead to the formation of ice particles especially in the troposphere and stratosphere has received considerable attention, but are still not fully understood even though this is the atmospheric region which is most accessible to in situ observations. We will describe a new type of experiment for the formation of water ice particles of sizes up to a few μm . The ice particles are created and levitated in a H_2 (or D_2)/ O_2 plasma chamber with the electrodes cooled by liquid nitrogen. The ice particles are produced within a second after plasma ignition. When the electrodes are warmed up, they disappear with increasing the water partial pressure in the chamber. Without plasma at oversaturated water vapor pressures, only condensation takes place on the cooled electrodes, but no visible particle formation is observed in the gas phase. In this system, plasma indeed has the effect for creating ice particles, i.e., gas decomposition and particle confinement in the plasma in which gas reactions take place.

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