Simple Overview of Cloud Seeding

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Introduction

Clouds form when raising air cools and water vapor condenses to form liquid drops. Cloud seeding is a weather modification technique generally employed to enhance precipitation or reduce hail (Figure). Cloud seeding entails releasing small particles into clouds to affect their development. Supercooled clouds (clouds with droplets at a temperature below 0 °C) can be seeded with ice nuclei, such as silver iodide. The introduction of silver iodide into supercool cloud regions by aircraft creates ice crystals (snow) which enhance the efficiency of precipitation production. Ice particles quickly grow in mixed-phase clouds at the expense of water droplets, obtaining sizes large enough to fall, pass into warm air, melt, and land as rain drops. The ice nuclei that typically occur naturally in the atmosphere only produce ice at cold temperatures (< -15 to -25 °C), while cloud seeding can produce ice in warmer (-5 to -15 °C) supercooled clouds. Production of ice at warmer temperatures increases the precipitation production efficiency of a factory.



Figure 1: Image illustrating how aircraft seeding to release with ice nuclei works.