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Source or Clarifying Statement: [redacted]

1. [redacted]

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"Heinz Theile (Inst Erdolforshung, Hannover, Germany) Erdol u Kohle 5, 407-12(1952). - Formation of fog in supersaturated vapor-gas mixtures takes place only when the heat transfer from the vapor-gas stream exceeds the diffusion of molecules to the walls. According to Hansen (cf C A 43, 11c) the ratio of the temperature coefficient of heat transfer to the diffusion coefficient is in the first approximation equal to the square root of the ratio of the molecular weight of vapor and gas. With the exception of $H_2O$, the condensable constituent will always have a higher molecular weight than the carrier gas. Since supersaturation alone does not suffice to cause fog formation, the question arose whether the spontaneous formation of nuclei during the cooling of vapor-gas mixtures is sufficient for fog formation. Hexane-N and furfural-N mixtures produced fogs when previously heated above 200 and 300 degrees /presumably Centigrade/, respectively. Addition of two per cent Oxygen to the hexane-N mixture at 500 to 570 degrees was particularly effective. Experiments indicated that foreign nuclei were necessary for the production of fog. Attempts to precipitate the nuclei in previously heated furfural-N mixtures electrostatically were unsuccessful because the diameter was less than $10^{-3}$cm. Filtering the gas stream through closely packed cotton or quartz wool was effective in most cases either in diminishing or preventing fog formation. Turbulance removed hexane fog completely. The rotating metal-band (cf C A 32, $7310^{3}$) method removed allyl bromide fog from hexane but did so only in part from undisturbed furfural. The rotating band method is not considered practical. It is shown diagrammatically that a 'superimposed heat stream' (addition of heat to the vapor-gas stream) prevents supersaturation completely. With proper arrangement (example shown) the heat capacity of the vapor-gas mixture can be utilized and may often suffice to prevent supersaturation."

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2. This is an example of basic physics research which can be applied to meteorology and weather modification. The experiments were performed in physics laboratories, but they could readily be applied to natural atmosphere with essentially the same conclusions.

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