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Aqueous droplets in a Leidenfrost state on near room temperature sulphuric acid STOFFEL JANSSENS, MOHAMED ABDELGAWAD, ELIOT FRIED, Okinawa Institute of Science and Technology Graduate University, MATHEMATICS, MECHANICS, AND MATERIALS UNIT TEAM — Droplets that hover above a condensed phase of matter, on a cushion of gas, are in the Leidenfrost state [1]. A typical example of this is a water droplet levitated by its own vapor above a heated pan [2, 3]. In the last few decades more exotic systems such as oil droplets hovering above warm oil [4, 5] or self-propelled acetone droplets hovering above warm water have attracted attention [6]. Acknowledging the dangers of adding water to an acid, we demonstrate that aqueous droplets at room temperature can be prepared in a Leidenfrost state above sulphuric acid at slightly higher temperatures. Guided and supported by experiments, possible mechanisms underlying non-coalescence of the droplets with the acid are discussed.

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