Supporting Information for

Micromechanical Interactions between Clathrate Hydrate Particles and Water Droplets: Experiment and Modeling

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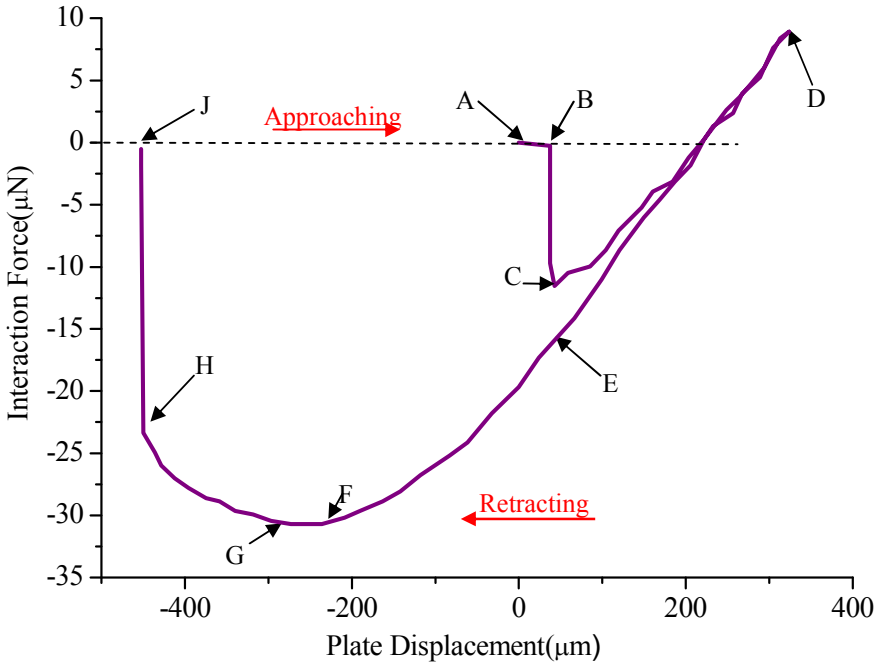

Figure S1. Typical hydrate particle-droplet interaction force profile of a measurement cycle in pure CyC5 at 7 ºC.

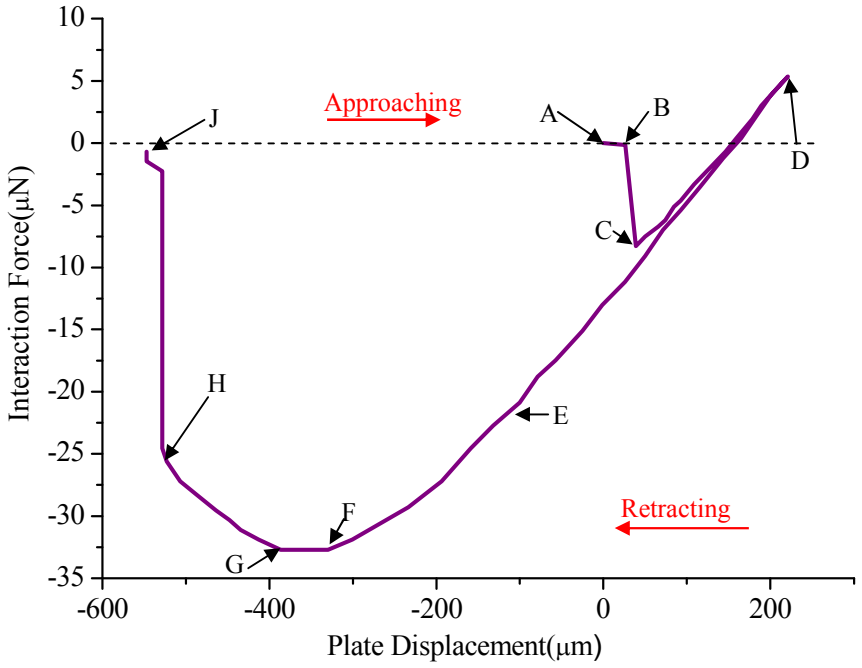

Figure S2. Typical hydrate particle-droplet interaction force profile of a measurement cycle in pure CyC5 at 1.5ºC.

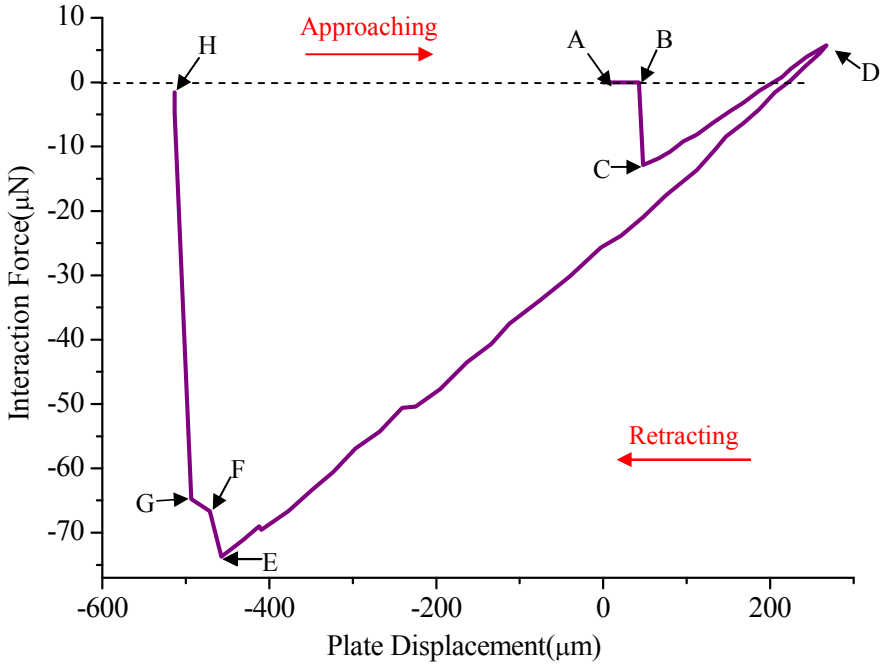

Figure S3. Typical hydrate particle-droplet interaction force profile of a measurement cycle in pure CyC5 at 0.7ºC.

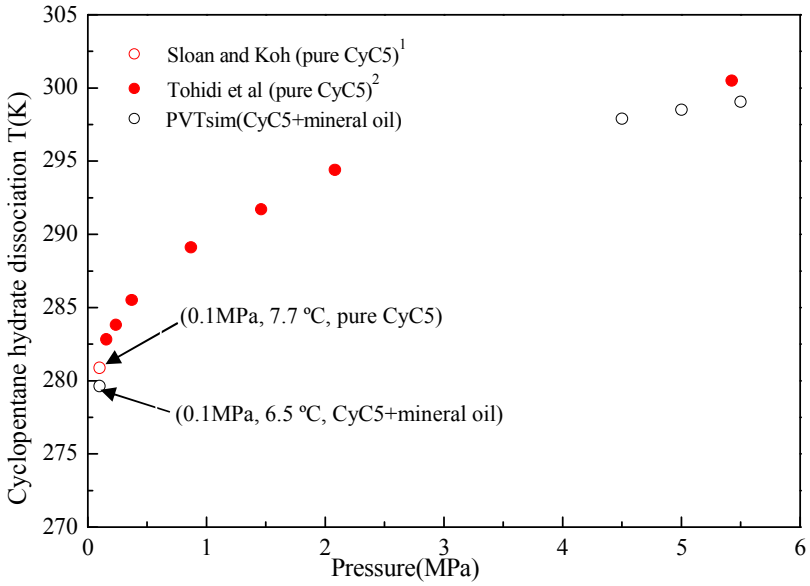

Figure S4. Cyclopentane hydrate phase equilibrium conditions. The addition of mineral oil decreases the cyclopentane hydrate equilibrium temperature at a given pressure. At atmospheric pressure, the hydrate equilibrium temperature of the CyC5+mineral oil mixture is about 6.5 ºC, while the hydrate equilibrium temperature of pure cyclopentane is about 7.7 ºC.

Table S1 Uncertainties for the parameters in Table 1

Parameter/units	Value	Parameter/units	Value
R_d/μm	262±2	$y(0)$/μm	201±3
R_p/μm	337±2	$y(d)$/μm	225±3
$V_d/10^7$μm^3	6.27±0.20	d/μm	307±4
φ_p /°	35.5±0.4	θ_p /°	93.7±1.2
h_d/μm	64±2	θ_s /°	124.3±1.1
γ_{hw}/mN·m^{-1}	48.4±1.6		

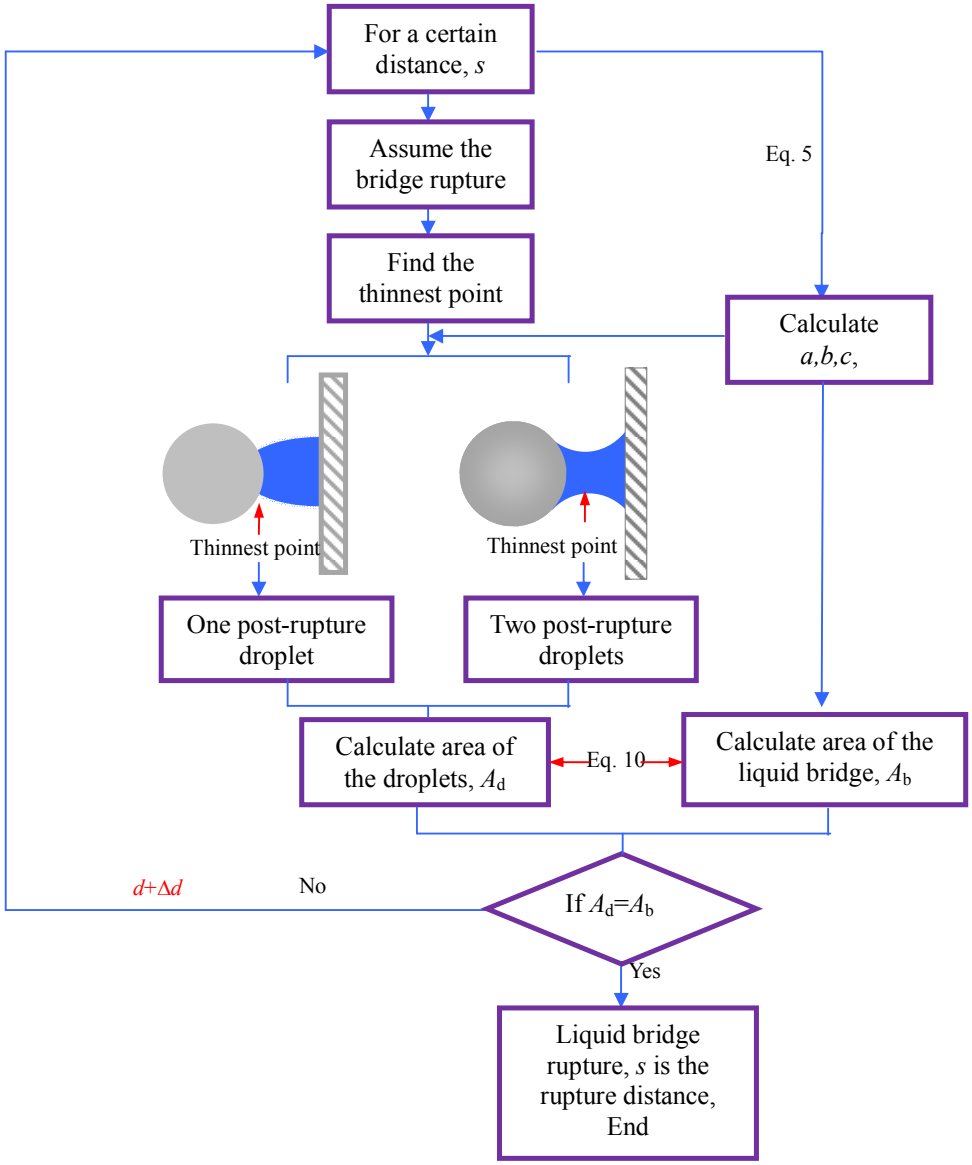

Figure S5. Flowchart for determining the rupture distance

Reference

(1) Sloan, E. D.; Koh, C. A. *Clathrate Hydrates of Natural Gases*, 3rd Ed., CRC Press, Taylor and Francis Group, 2007.

(2) Tohidi, B.; Danesh, A.; Todd, A.; Burgass, R.W.; Østergaard, K.K. *Fluid Phase Equilib.* 1997, *138*, 241-250.