Supporting Information for

Significance of chemical engineering in surface wettability tuning and its boiling hydrodynamics: A boiling heat transfer study.

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Table S1. Morphology of nanotubes and contact angles of surfaces anodized at different voltages.

Voltage (V)	Wall thickness (nm)	Pore diameter (nm)	Porosity (%)	Contact angle (°)
10	7	41	60	7.23
20	9	72	67	5.30
30	7	100	80	3.25
40	15	135	70	4.49

Figure S1. FESEM images of nanotubes fabricated at different voltages [a) 10V, b) 20V, c) 30V, d) 40V]

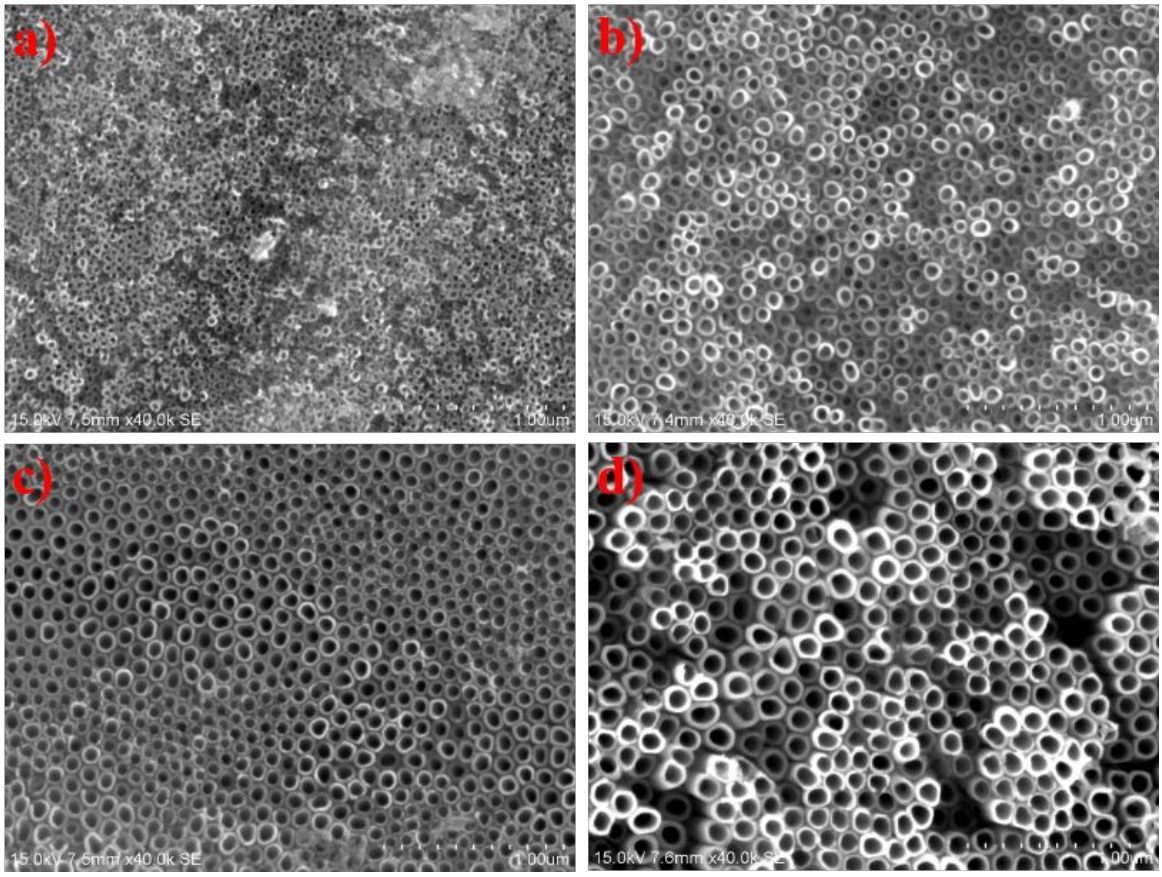
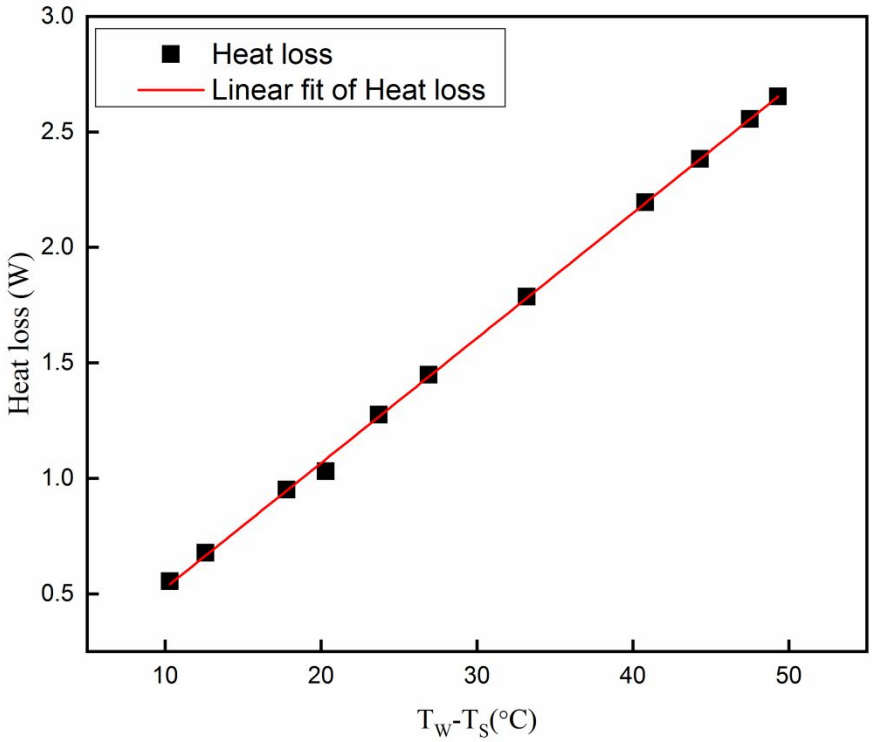


Figure S2. Heat loss to the surroundings from experimental setup.



The linear difference in temperature between the system and the surroundings is accommodated to determine the heat loss through the relation given below.

$$Q_{loss} = 0.0538(T_{se} - T_{su})$$

$$T_{se} \rightarrow temperature\ of\ surface$$

$$T_{su} \rightarrow temperature\ of\ surroundings$$

Figure S3. Contact angle images of nanotube surface fabricated at different voltage

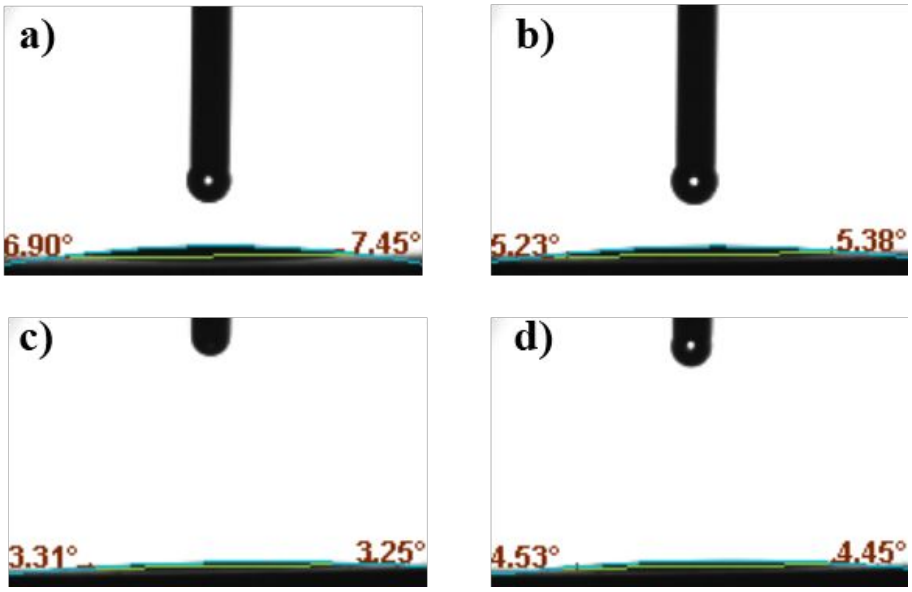


Figure S4. Capillary wicking of test surfaces with respect to time

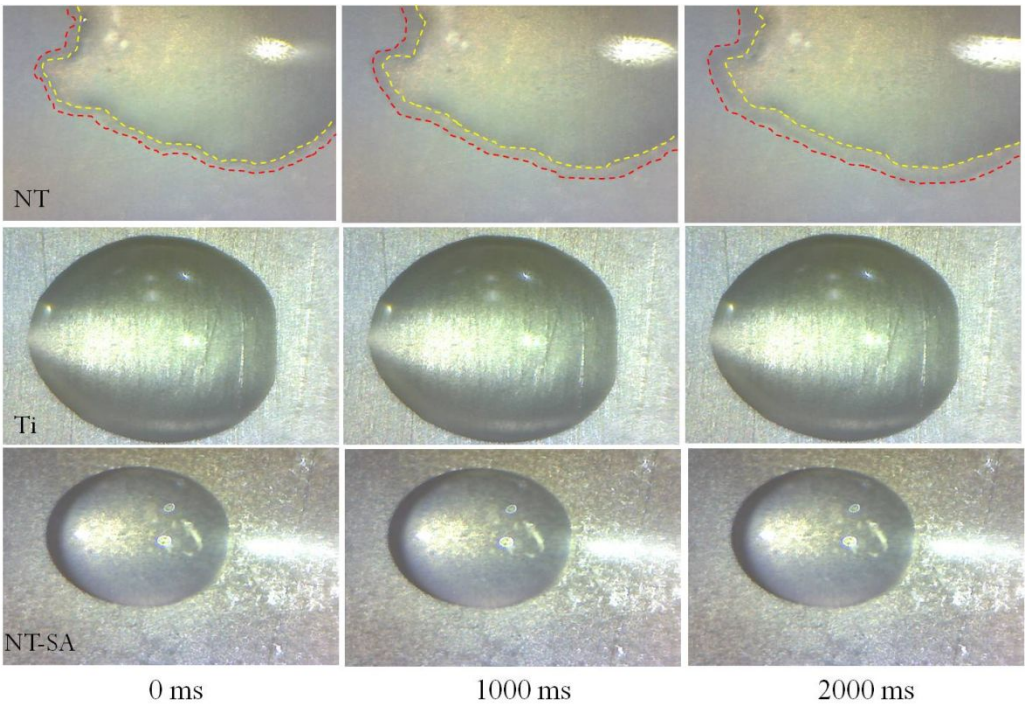


Figure S5. Regression analysis on contact angle measurement

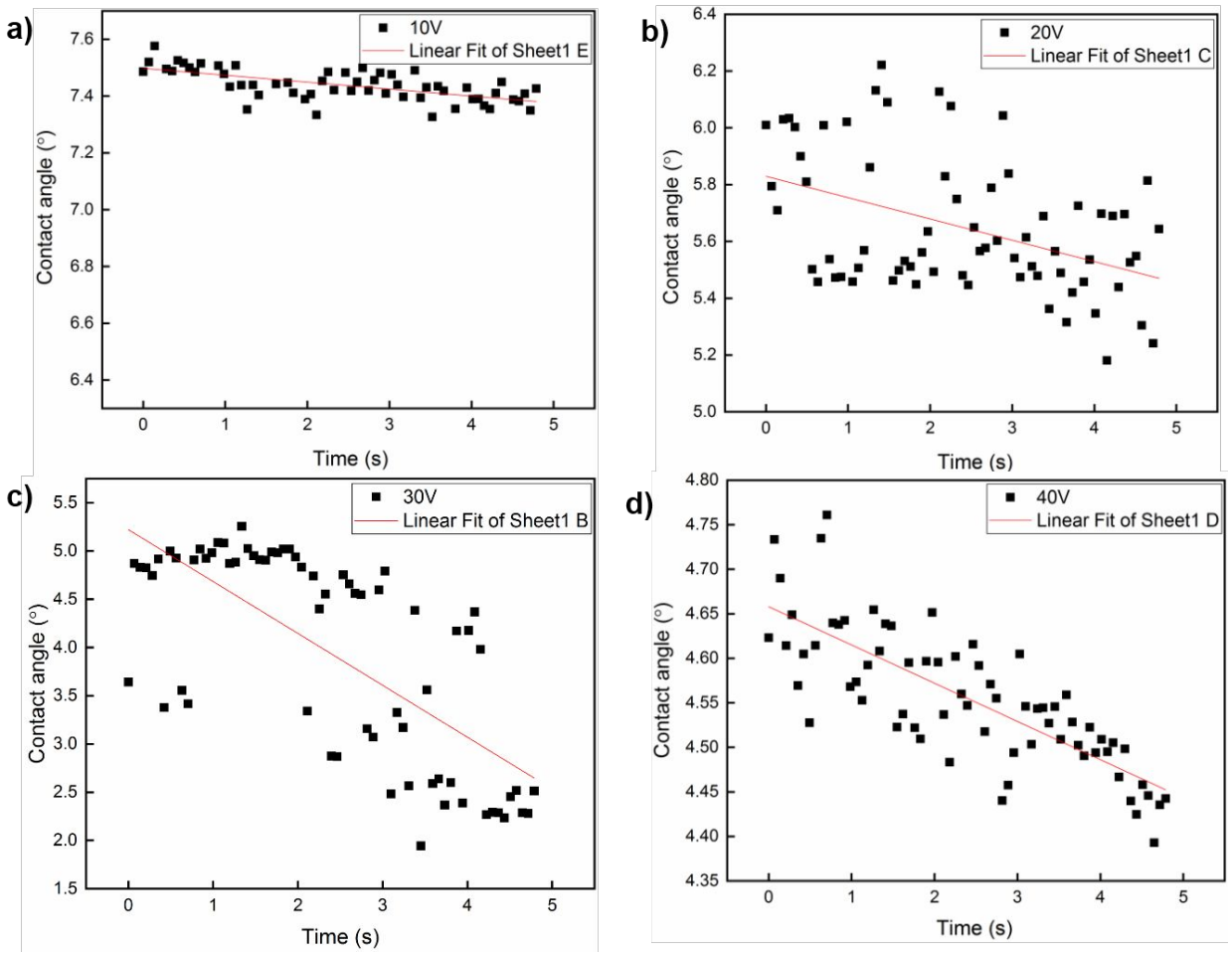
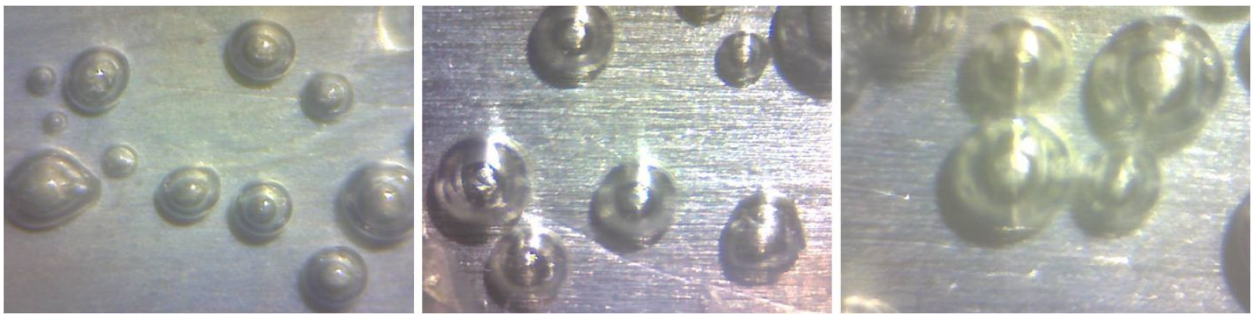


Figure S6. Nucleation density of test surfaces (NT, Ti and NT-SA)



Uncertainty Analysis:

$$\Delta q = \sqrt{\left[\left(\frac{\partial q}{\partial U}\right)^2 (\Delta U)^2 + \left(\frac{\partial q}{\partial I}\right)^2 (\Delta I)^2 + \left(\frac{\partial q}{\partial L}\right)^2 (\Delta L)^2\right]} \quad (1)$$

$$\Delta T_w = \sqrt{\left[\left(\frac{\partial T_w}{\partial T_m}\right)^2 (\Delta T_m)^2 + \left(\frac{\partial T_w}{\partial T_q}\right)^2 (\Delta q)^2 + \left(\frac{\partial T_w}{\partial x_m}\right)^2 (\Delta x_m)^2\right]} \quad (2)$$

$$\Delta h = \sqrt{\left[\left(\frac{\partial h}{\partial q}\right)^2 (\Delta q)^2 + \left(\frac{\partial h}{\partial T_w}\right)^2 (\Delta T_w)^2 + \left(\frac{\partial h}{\partial T_{sat}}\right)^2 (\Delta T_{sat})^2\right]} \quad (3)$$

$$T_w = T_m - q\frac{x_m}{k_C} \quad (4)$$

T_w,T_m →*calculated and measured temperature of boiling surface*

x_m→*measured distance between thermocouple and boiling surface*

U, I, L→*applied voltage,measured current and dimension of heater surface*

k_c→*thermal conductivity of copper*